Office for National Statistics

Statistical bulletin

Low carbon and renewable energy economy, UK: 2018

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

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1 . Main points

- Turnover in the UK low carbon and renewable energy economy (LCREE) was estimated to be £46.7 billion in 2018 (£40.4 billion in 2015).
- Employment in the UK LCREE was estimated to be 224,800 full-time equivalent (FTE) in 2018 (200,800 FTE in 2015).
- The energy efficient products sector remained the largest component of the UK LCREE in 2018, accounting for 36% (£16.7 billion) of UK LCREE turnover, and 51% (114,400 FTE) of UK LCREE employment.
- The largest proportion of total UK LCREE turnover and employment in 2018 was from businesses classified within the manufacturing industry, which account for around one-third of LCREE turnover (32%) and employment (37%).
- The low emission vehicles sector accounted for 59% (£3.1 billion) of total UK LCREE exports (£5.3 billion) in 2018.
- Total investment in the LCREE increased by 48% between 2015 and 2018, to stand at £8.1 billion in 2018; this was mainly the result of a rise in acquisitions by the offshore wind sector (up £3.5 billion between 2015 and 2018).

2 . Turnover and employment

In 2018, businesses active in the UK low carbon and renewable energy economy (LCREE) generated £46.7 billion in turnover, with employment of 224,800 full-time equivalent (FTE) (Table 1 and Table 2).

The LCREE accounted for around 1% of total UK non-financial turnover and employment in 2018, similar to 2015 to 2017. This figure was slightly higher for Scotland, Wales and Northern Ireland than England and the UK as a whole, suggesting that the LCREE is relatively more important in those countries.

All estimates in this bulletin are given in current prices as provided by the LCREE Survey respondents, with no adjustments made to account for the effects of inflation. To help give an idea of the impact of inflation, adjusting using the Consumer Prices Index (CPI base year of 2018) would provide a 2015 total UK turnover estimate of £42.8 billion, compared with the current price-based estimate of £40.4 billion.

Table 1: In 2018, businesses active in the UK low carbon and renewable energy economy (LCREE) generated £46.7 billion in turnover

Low carbon and renewable energy economy, turnover estimates and confidence intervals (CI), UK and constituent countries, 2015 to 2018 (£ billion)

	2015	2016	2017	2018
UK estimate	**40.4**	**41.1**	**44.6**	**46.7**
Lower CI	37.3	37.6	41.7	42.6
Upper CI	43.4	44.7	47.5	50.8
England estimate	32.1	31.9	35.8	37.1
Lower CI	29.2	28.8	33.2	33.3
Upper CI	34.9	35.0	38.4	40.9
Scotland estimate	5.6	5.9	6.0	6.4
Lower CI	5.1	5.2	5.4	5.6
Upper CI	6.1	6.7	6.5	7.2
Wales estimate	1.8	2.4	1.9	2.2
Lower CI	1.5	1.5	1.6	1.9
Upper CI	2.0	3.2	2.2	2.4
Northern Ireland estimate	0.9	0.9	1.0	1.1
Lower CI	0.8	0.7	0.8	0.9
Upper CI	1.1	1.1	1.2	1.3

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

Notes

1. Figures may not sum due to rounding. Back to table

2. The year on year differences should be interpreted with caution because of the precision of survey-based estimates. 95% confidence intervals (CI), a standard way of expressing the statistical accuracy of a survey-based estimate, are provided in the table. A 95% confidence interval is a range within which the true population would fall for 95% of the time the survey was repeated. If an estimate has a high error level, the corresponding confidence interval will be very wide. Back to table

3. Coefficients of variation (CVs), which provide another indicator of the quality of these estimates can be found in the datasets accompanying this release. Back to table

4. Figures have been rounded to the nearest £0.1 billion in the table (but are available to the nearest £500,000 in the datasets accompanying this release). Back to table

Table 2: In 2018, businesses active in the UK low carbon and renewable energy economy (LCREE) employed 224,800 full-time equivalent (FTE)
Low carbon and renewable energy economy, employment estimates and confidence intervals (CI), UK and constituent countries, 2015 to 2018 (full-time equivalent)

	2015	2016	2017	2018
UK estimate	**200,800**	**211,000**	**219,900**	**224,800**
Lower CI	177,100	185,000	201,000	196,700
Upper CI	224,600	237,100	238,800	253,000
England estimate	163,300	167,900	181,800	185,000
Lower CI	141,600	144,400	163,700	157,900
Upper CI	184,900	191,300	199,900	212,100
Scotland estimate	22,900	24,000	22,100	23,100
Lower CI	16,500	18,500	19,400	19,000
Upper CI	29,300	29,600	24,800	27,200
Wales estimate	10,200	12,900	10,100	11,400
Lower CI	7,100	7,100	8,500	9,100
Upper CI	13,400	18,700	11,600	13,600
Northern Ireland estimate	4,400	6,200	6,000	5,400
Lower CI	3,800	4,700	4,700	4,300
Upper CI	5,100	7,700	7,200	6,500

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

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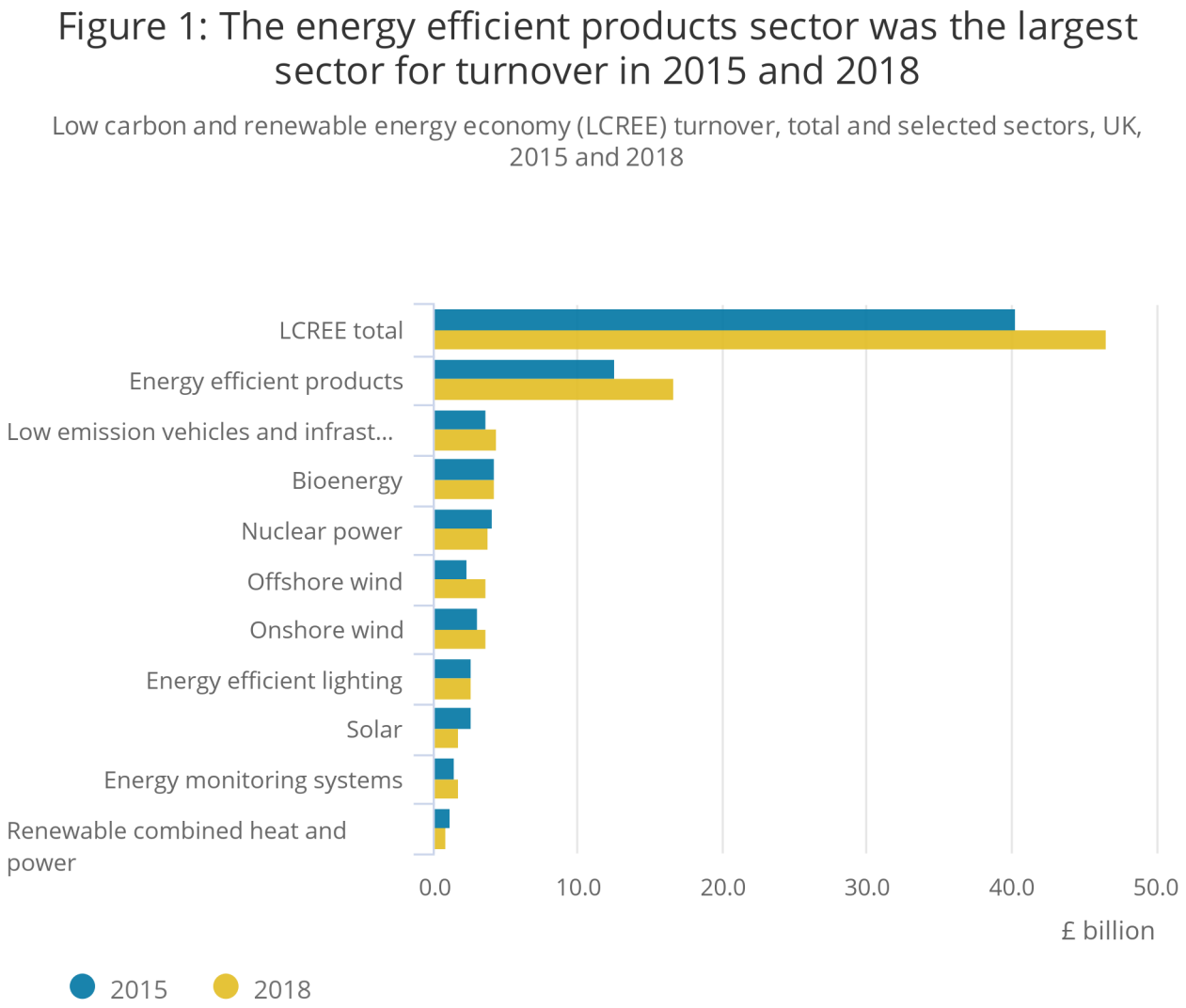
3 . Sectors

Figure 1: The energy efficient products sector was the largest sector for turnover in 2015 and 2018

Low carbon and renewable energy economy (LCREE) turnover, total and selected sectors, UK, 2015 and 2018



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

Notes:

1. The chart shows the 10 largest low carbon sectors in 2018, data for the other sectors are available in the dataset, along with confidence intervals and coefficients of variation (CVs) for all estimates.

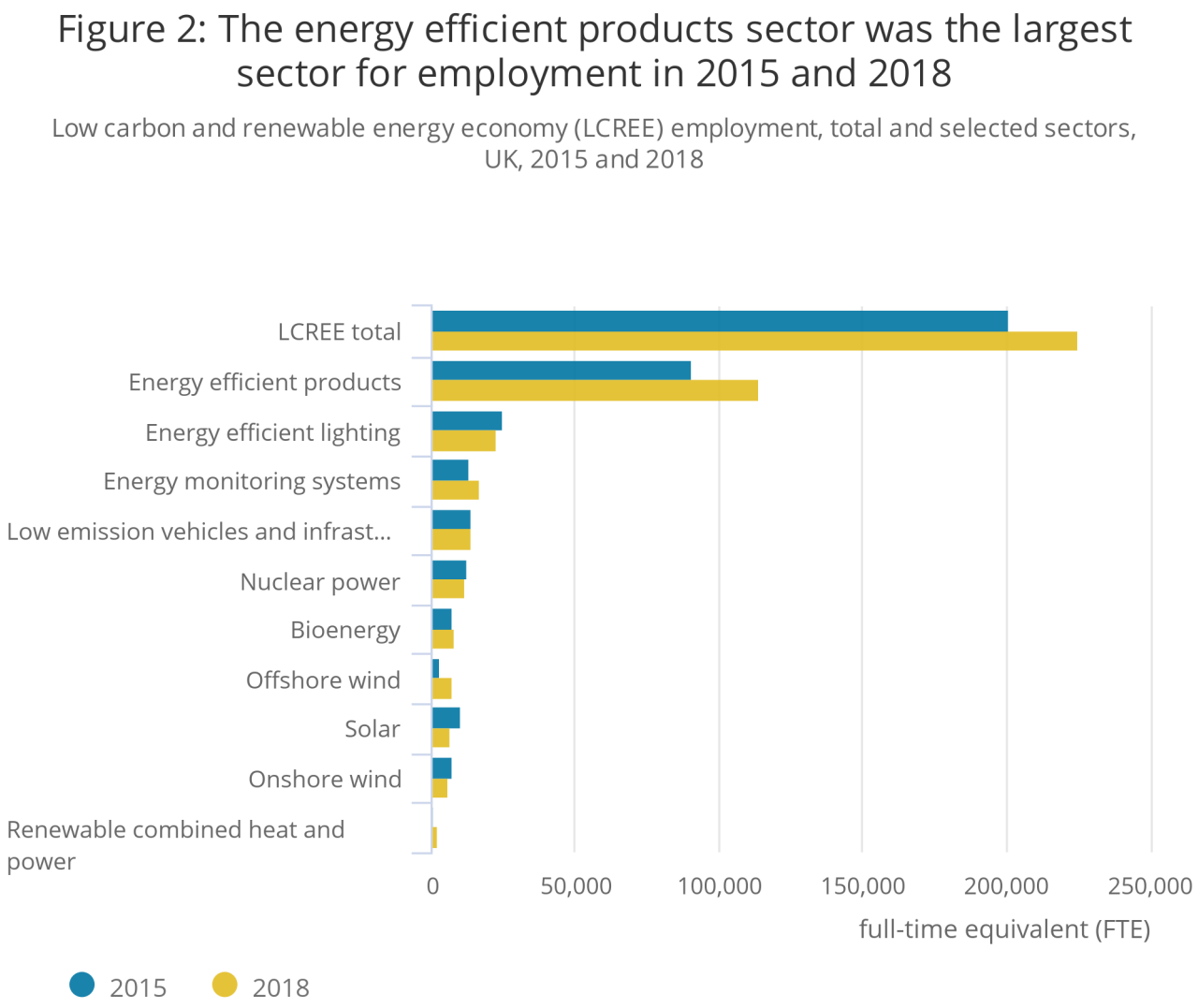
2. For full sector definitions of what is included in each LCRE sector please see Table 2 of the Quality and Methodology Information report.

3. Figures have been rounded to the nearest £0.1 billion in the chart (but are available to the nearest £500,000 in the dataset).

4. Energy monitoring systems covers energy monitoring, saving or control systems.

Figure 2: The energy efficient products sector was the largest sector for employment in 2015 and 2018

Low carbon and renewable energy economy (LCREE) employment, total and selected sectors, UK, 2015 and 2018



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

Notes:

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2. For full sector definitions of what is included in each LCRE sector please see Table 2 of the Quality and Methodology Information report.

3. Figures have been rounded to the nearest 100.

The energy efficient products sector (which excludes energy efficient lighting) remained the largest sector of the UK low carbon and renewable energy economy (LCREE) in 2018, accounting for 36% (£16.7 billion) of UK LCREE turnover and 51% (114,400 full-time equivalent (FTE)) of LCREE employment (Figures 1 and 2). Examples of activity within this sector includes the design, manufacture or installation of energy efficient doors, windows and insulation. For full sector definitions of what is included in each LCRE sector, please see Table 2 of the Low Carbon and Renewable Energy Economy (LCREE) Survey QMI.

The second-largest sector in terms of LCREE turnover in 2018 was the low emission vehicles sector, which includes the design and manufacture of vehicles with specific technology to significantly reduce or remove emissions. This sector accounted for 9% (£4.4 billion) of LCREE turnover and 6% of LCREE employment. These proportions were similar in 2015.

The bioenergy sector was the third-largest UK LCRE sector in relation to turnover, generating £4.3 billion in 2018, similar to the 2015 estimate. This sector accounted for 9% of the LCREE turnover and 4% of LCREE employment. Examples of activity in the bioenergy sector include the production of energy from renewable bioenergy sources such as wood pellets and the design, production and installation of infrastructure for this purpose.

LCREE turnover within the solar sector was £1.8 billion in 2018, with employment of 6,600 FTE. Estimates for turnover and employment in 2015 were £2.7 billion and 9,900 FTE respectively. Changes in LCREE turnover and employment for solar may have been influenced by changes in renewable energy subsidies (feed-in tariffs) that have reduced since early 2016.

4 . Industries

Businesses classified (according to Standard Industrial Classification 2007) within manufacturing, energy supply and construction industries accounted for the largest proportion of the UK low carbon and renewable energy economy (LCREE) turnover in 2018 (Figure 3). Businesses within these industries accounted for a turnover of £39.3 billion, 84% of all turnover in the LCREE. The majority of turnover within these businesses related to activity within the energy efficient products sector.

Businesses within the manufacturing industry generated the largest proportion of (LCREE) turnover and employment compared with any other industry in 2018. This industry generated £15.2 billion turnover and employed 83,600 full-time equivalent (FTE), around one-third (32%) of the total UK LCREE turnover, and 37% of LCREE employment in 2018.

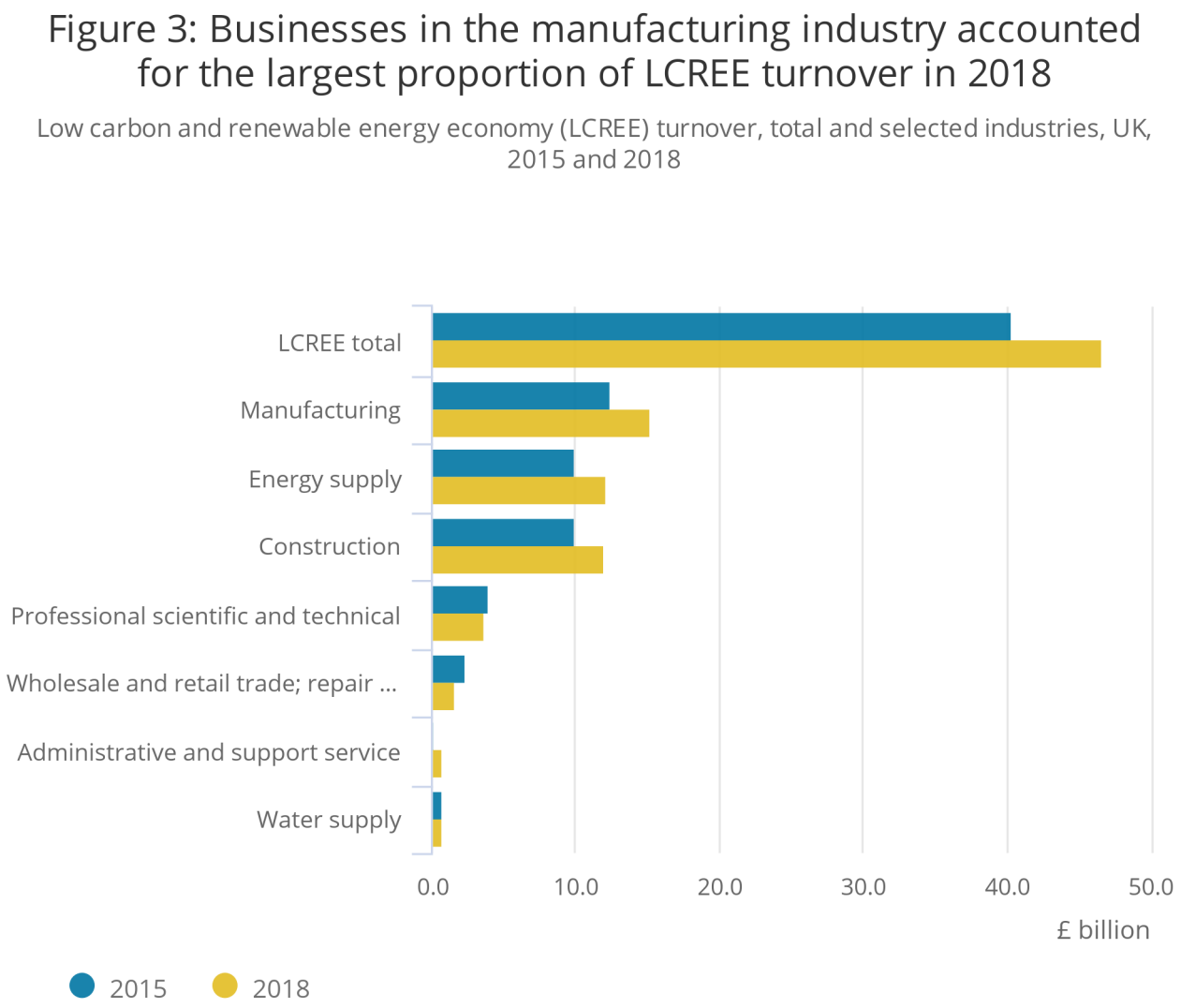
Businesses classified within the manufacturing industry include those carrying out activities relating to the manufacture of motor vehicles and their associated components. This would therefore include activity relating to the LCRE sector of low emission vehicles.

The energy supply and construction industries together made up over half of total LCREE turnover – energy supply at £12.2 billion in 2018 (£9.9 billion in 2015) and construction at £12.0 billion (£10.0 billion in 2015).

Businesses classified within the energy supply industry can include activities relating to the generation of energy from sources such as wind, nuclear and bioenergy. LCREE employment in this industry was 16,500 FTE in 2018 (11,500 FTE in 2015). These activities can be less labour intensive when compared with other industries. LCREE employment in this industry was 16,500 FTE in 2018 compared with 83,600 and 82,000 FTE in the manufacturing and construction industries respectively.

Figure 3: Businesses in the manufacturing industry accounted for the largest proportion of LCREE turnover in 2018

Low carbon and renewable energy economy (LCREE) turnover, total and selected industries, UK, 2015 and 2018



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

Notes:

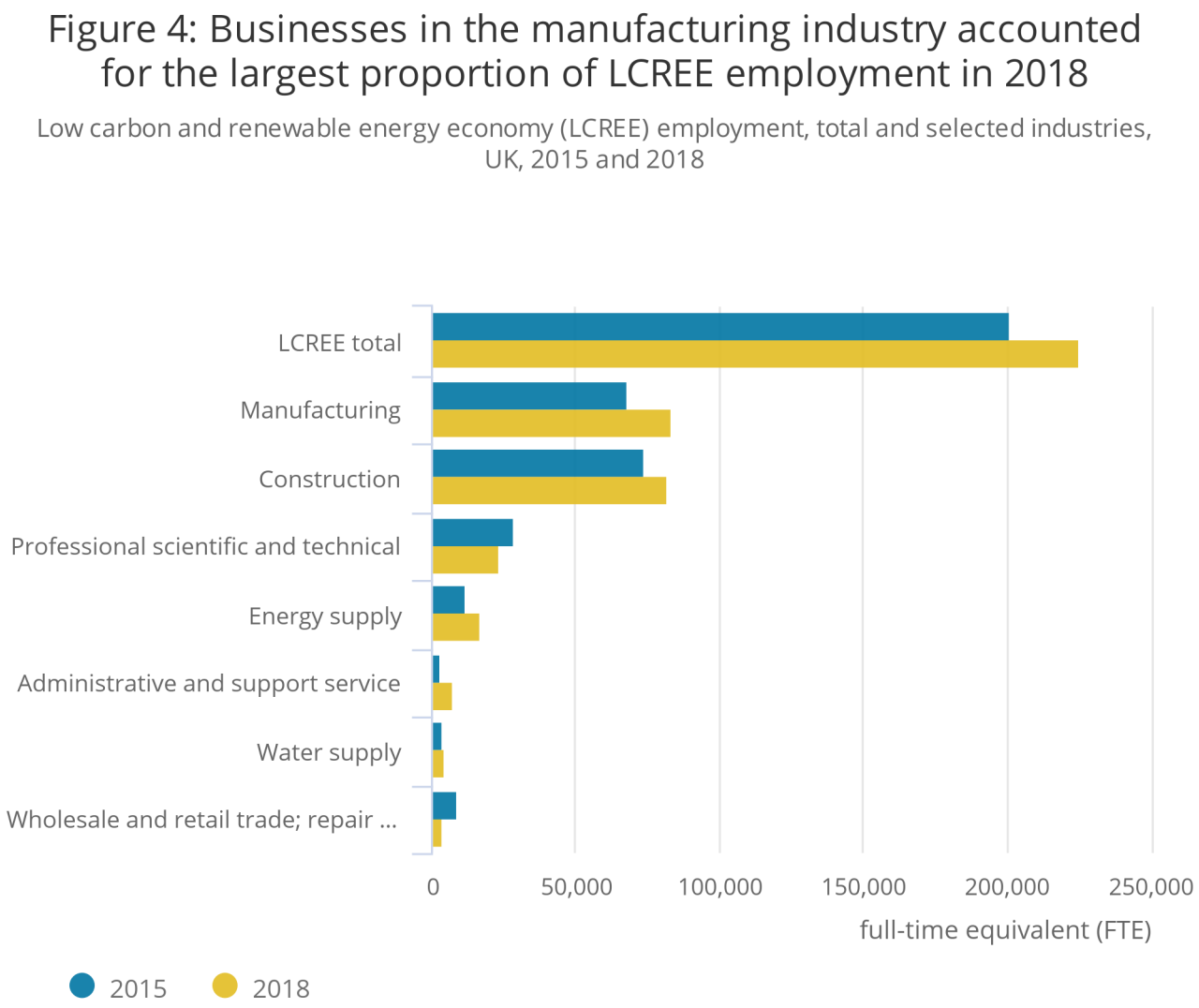
1. The chart shows the seven largest industries in 2018, data for the other industries are available in the dataset, along with confidence intervals and coefficients of variation (CVs) for all estimates.

2. Figures have been rounded to the nearest £0.1 billion in the chart (but are available to the nearest £500,000 in the dataset).

3. For simplicity, the Electricity, gas, steam and air conditioning supply category is referred to as “Energy supply” and the Water supply; sewerage, waste management and remediation activities category is referred to as “Water supply”.

Figure 4: Businesses in the manufacturing industry accounted for the largest proportion of LCREE employment in 2018

Low carbon and renewable energy economy (LCREE) employment, total and selected industries, UK, 2015 and 2018



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

Notes:

1. The chart shows the seven largest industries in 2018, data for the other industries are available in the dataset, along with confidence intervals and coefficients of variation (CVs) for all estimates.

2. Figures have been rounded to the nearest 100.

3. For simplicity, the Electricity, gas, steam and air conditioning supply category is referred to as “Energy supply” and the Water supply; sewerage, waste management and remediation activities category is referred to as “Water supply”.

5 . Investment

Businesses active in the low carbon and renewable energy economy (LCREE) acquired £8.1 billion of capital assets in 2018, an increase of £2.6 billion compared with 2015 (Figure 5). The LCRE sector with the highest level of acquisitions of capital assets in 2018 was the offshore wind sector (£4.2 billion in 2018 compared to £0.7 billion in 2015).

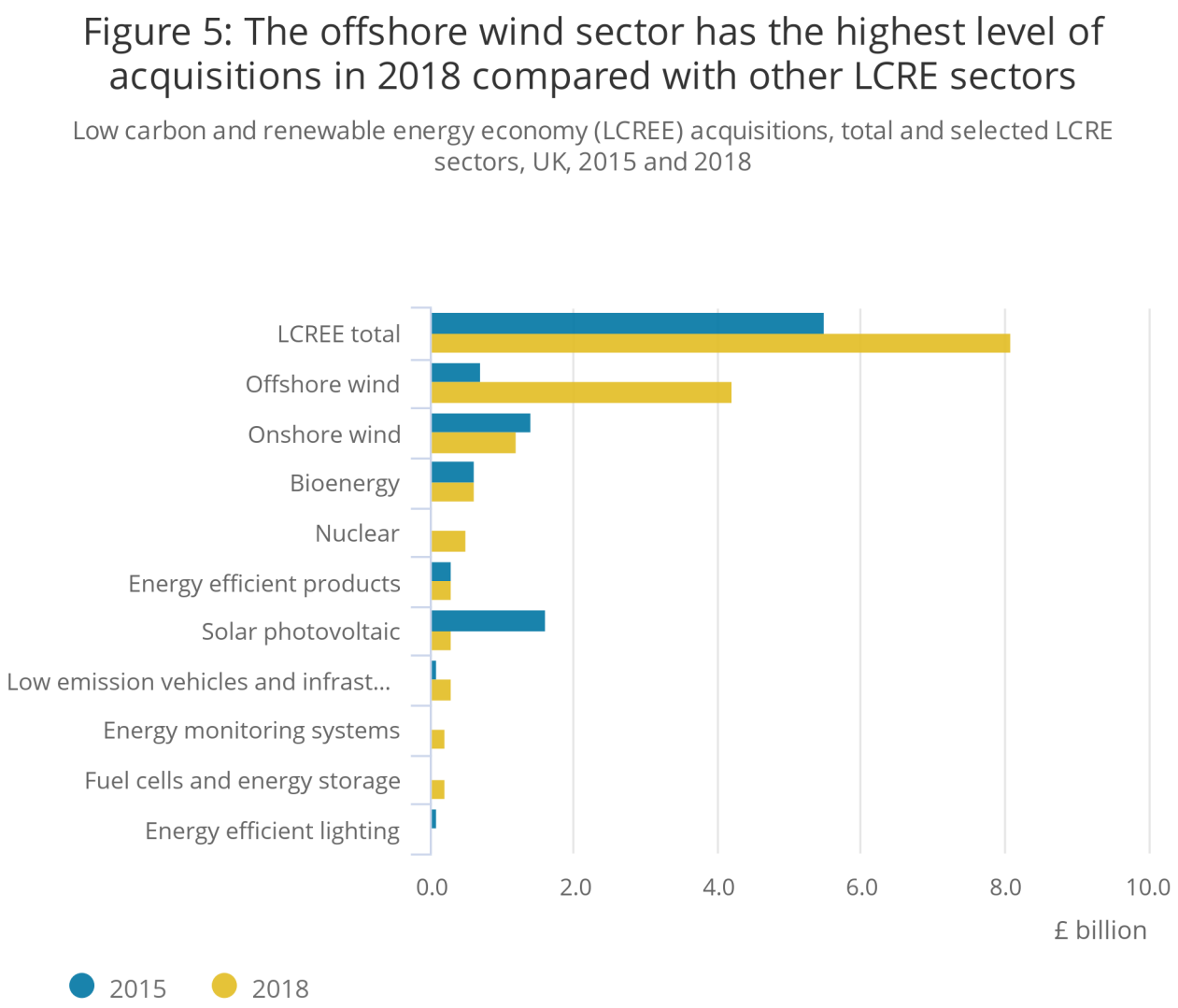
Offshore wind is a growing sector in terms of investment. Businesses in this sector often have contracts for the construction and development of new wind farms, so large one-off items within these sectors are not unusual.

In 2015, the solar sector accounted for the largest proportion (30%) of the UK LCREE acquisitions of capital assets, but by 2018 this had fallen to around 4%. Comparing acquisitions over time is difficult, as a low level of investment in the current year may just reflect high investment in previous years (for example, purchase of land for building a solar farm).

The lower level of acquisitions in the solar sector (around £0.3 billion in 2018, compared with £1.6 billion in 2015), may also have been influenced by changes in renewable subsidies (feed-in tariffs).

Figure 5: The offshore wind sector has the highest level of acquisitions in 2018 compared with other LCRE sectors

Low carbon and renewable energy economy (LCREE) acquisitions, total and selected LCRE sectors, UK, 2015 and 2018



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

Notes:

1. The chart shows the 10 largest low carbon sectors in 2018, data for the other sectors are available in the dataset, along with confidence intervals and coefficients of variation (CVs) for all estimates.

2. Data for the nuclear sector in 2015 has been suppressed for confidentiality reasons.

3. For full sector definitions of what is included in each LCRE sector please see Table 2 of the Quality and Methodology Information report.

4. Figures have been rounded to the nearest £0.1 billion in the chart (but are available to the nearest £500,000 in the dataset).

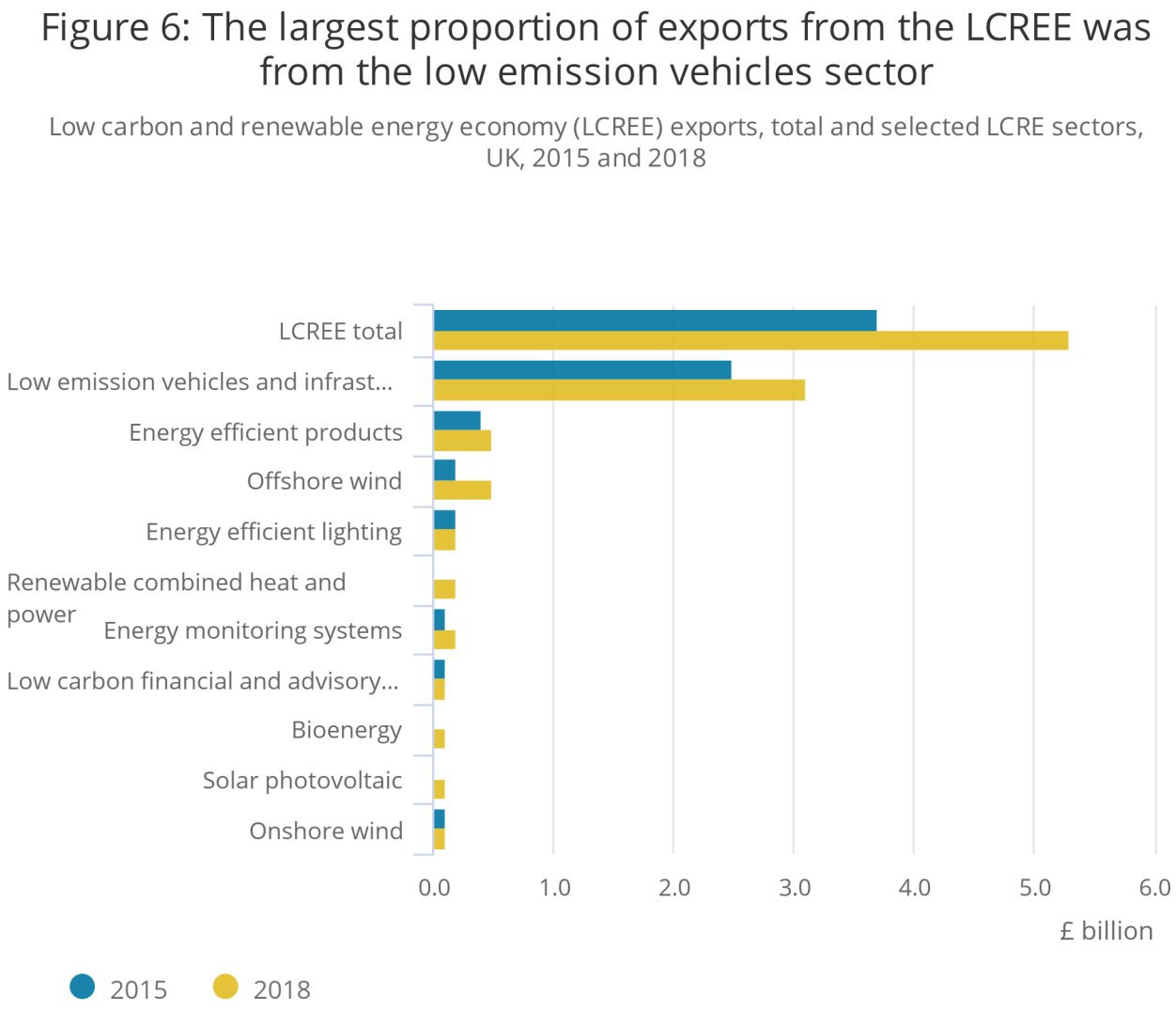
5. Energy monitoring systems covers energy monitoring, saving or control systems.

6 . Exports and imports

Export of goods and services by businesses active in the UK low carbon and renewable energy economy (LCREE) is estimated to be £5.3 billion in 2018, up from £3.7 billion in 2015 (Figure 6). The largest proportion of this income was from the export of goods and services in the low emission vehicles sector, which accounted for £3.1 billion, nearly 60% of the total UK LCREE exports. In 2015, the low emission vehicles sector accounted for £2.5 billion exports.

Figure 6: The largest proportion of exports from the LCREE was from the low emission vehicles sector

Low carbon and renewable energy economy (LCREE) exports, total and selected LCRE sectors, UK, 2015 and 2018



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

Notes:

1. The chart shows the 10 largest low carbon sectors in 2018, data for the other sectors are available in the dataset, along with confidence intervals and coefficients of variation (CVs) for all estimates.

2. Data for the renewable combined heat and power sector in 2015 has been suppressed for confidentiality reasons.

3. For full sector definitions of what is included in each LCRE sector please see Table 2 of the Quality and Methodology Information report.

4. Figures have been rounded to the nearest £0.1 billion in the chart (but are available to the nearest £500,000 in the dataset).

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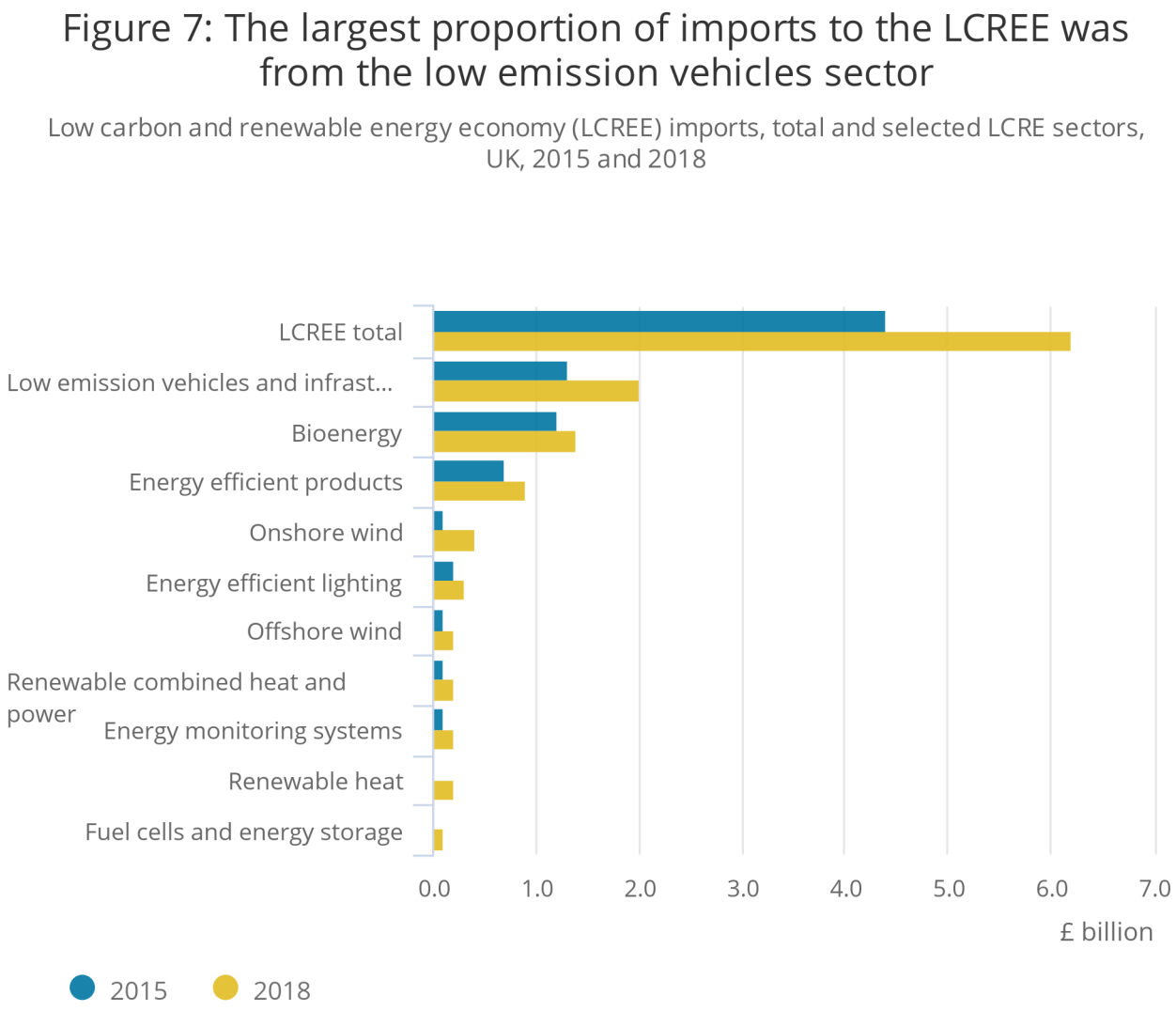
The import of goods and services by businesses active in the UK LCREE has increased since 2015, with imports of £6.2 billion in 2018 and £4.4 in 2015 billion (Figure 7). The largest proportion of expenditure on imports of goods and services was also within the low emission vehicles sector accounting for one-third of the total UK LCREE imports in 2018.

Figure 7: The largest proportion of imports to the LCREE was from the low emission vehicles sector

Low carbon and renewable energy economy (LCREE) imports, total and selected LCRE sectors, UK, 2015 and 2018



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

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7 . Low carbon and renewable energy economy data

Low carbon and renewable energy economy final estimates
Dataset | Released 16 January 2020
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.

8 . Glossary

Acquisitions

Refers to the purchase of capital assets (fixed assets), which are items used repeatedly to facilitate production or provide services, for more than one year.

Employment

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

Industry

Businesses are classified into an industry using the current Standard Industrial Classification (SIC) by the type of economic activity in which they are engaged.

Low carbon and renewable energy economy (LCREE)

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

Low carbon and renewable energy (LCRE) sector

The LCREE Survey asks UK businesses to self-classify themselves into 17 low carbon and renewable energy sectors. A list of these sectors can be found in Section 9. Measuring the data. A business can be active in more than one sector.

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.

9 . Measuring the data

Data sources and collection

The Low Carbon and Renewable Energy Economy (LCREE) Survey was designed to provide greater detail on the low carbon and renewable energy economy (LCREE) in the UK. The survey was despatched for the fifth time in 2019, for the reporting year 2018, to a sample of around 24,000 businesses.

The survey collects information on turnover, imports, exports, employment, and acquisitions and disposals of capital assets, for 17 low carbon sectors. These are:

- Offshore wind
- Onshore wind
- Solar photovoltaic
- Hydropower
- Other renewable electricity
- Bioenergy
- Alternative fuels
- Renewable heat
- Renewable combined heat and power
- Energy efficient lighting
- Other energy efficient products
- Energy monitoring, saving or control systems
- Low carbon financial and advisory services
- Low emission vehicles and infrastructure
- Carbon capture and storage
- Nuclear
- Fuel cells and energy storage

Coverage

Only the portion of economic activity of a business that directly relates to low carbon activities is included.

This bulletin discusses estimates from the UK LCREE Survey for 2018 and revised figures for 2017 to 2015. Data for 2014, the first year of the survey, are included in the dataset only – see “Comparability with 2014 estimates” in Section 10. Results are discussed at the UK level followed by analysis of the contribution of specific countries, LCRE sectors and industries.

Revisions

This release contains revisions to 2014 to 2017 estimates since they were published in January 2019. Revisions are not unusual in the first few years of a new survey and result from a variety of factors, including:

- the incorporation of additional data received from businesses who have been sampled in multiple years of the survey
- changes to data as a result of businesses revising their previous submissions
- developments in methodology

Table 3 shows the effect of revisions to 2017 data on estimates of UK turnover, employment, imports, exports, acquisitions and disposals. Revisions have also been made to 2016 to 2014 data.

Revisions may continue to be made to the entire time series if the survey methodology changes in the future.

Table 3: Revisions to Low Carbon and Renewable Energy Economy Survey estimates, UK, 2017

	Latest estimate	Previously published estimate	Percentage change
Turnover (£ billions)	44.6	44.5	0.4
Employment (FTE)	219,900	209,500	5.0
Imports (£ billions)	6.0	5.9	1.9
Exports (£ billions)	5.2	5.0	4.0
Acquisitions (£ billions)	5.9	5.6	5.0
Disposals (£ billions)	0.2	0.2	-6.6

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

Notes

1. Employment is rounded to the nearest 100 full-time equivalent (FTE). Back to table
2. All other variables are rounded to the nearest £0.1 billion. Back to table
3. Percentage change is calculated on the figures as published in the dataset. Back to table

Quality and methodology

More quality and methodology information on the strengths, limitations, appropriate uses, and how the data were created is available in the Low Carbon and Renewable Energy Economy (LCREE) Survey QMI. This includes further detail on the methods used to calculate business counts for sectors within the LCREE.

10 . Strengths and limitations

Limitations

Activity in the low carbon and renewable energy economy (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. For this reason, estimates of the number of businesses are subject to particular volatility and, though provided in the datasets, are not directly considered within this statistical bulletin.

Uncertainty

The figures in this bulletin are survey-based estimates and gather information from a sample rather than the whole population. This means that they are subject to some uncertainty, which can have an effect on how changes in the estimates should be interpreted. Estimates of the level of uncertainty associated with all figures (coefficients of variation and confidence intervals) reported are presented in the bulletin and datasets to aid interpretation.

In general, changes in the estimates reported in this statistical bulletin between 2015 and 2018 are not usually greater than the level that is explainable by sampling variability. This means movements in the estimates should be treated as indicative only.

Sample size

The LCREE Survey was despatched for the fifth time in 2019, for the reporting year 2018, to a sample of 24,118 businesses. It achieved a response rate of 81% and of those responding, 2,572 businesses were operating in the LCRE sectors captured by the survey.

We designed the survey to provide greater detail on the UK LCREE. Results from the survey can be used to show business activity in 17 low carbon sectors which can be aggregated to show activity in six low carbon groups (in the dataset). More information on the sample, groups and sectors is available in the Low Carbon and Renewable Energy Economy (LCREE) Survey QMI.

Comparability with 2014 estimates

Estimates for 2014 are provided in the dataset accompanying the statistical bulletin only. Comparing estimates from 2014 with estimates from later years of the survey is not advised because of changes in the sample methodology in 2015. The survey sample size was reduced from around 40,000 in 2014 to around 14,000 in 2015.

To enhance the sample for 2015, a number of businesses that were known to have activity in the LCREE were selected. As they were not selected through random sampling, the weight applied to them to estimate for non-response is lower than it was in 2014. This partially explains why the estimates for the LCREE are generally lower in 2015 compared with 2014.

11 . Related links

UK Environmental Accounts: 2019
Bulletin | Released 5 June 2019
Measuring the contribution of the environment to the economy, the impact of economic activity on the environment, and society's response to environmental issues. Satellite accounts to the main UK National Accounts.

A burning issue: biomass is the biggest source of renewable energy consumed in the UK
Article | Released 30 August 2019
Analysis reveals the contribution of burning organic material from plants, trees and animals – including millions of tonnes of imported wood pellets from the USA and Canada – to the UK's energy mix. What is its environmental impact?

Net zero and the different official measures of the UK's greenhouse gas emissions
Article | Released 24 July 2019
The UK government has announced a target of net zero for UK greenhouse gas (GHG) emissions by 2050. This article explains what net zero means, how progress towards it is measured and the differences between official measures of UK GHG emissions.

Road transport and air emissions
Article | Released 16 September 2019
Contribution of road transport to greenhouse gas and air pollutant emissions – further analysis of the UK Environment Accounts data.