Office for National Statistics

Statistical bulletin

Low carbon and renewable energy economy, UK: 2017

Final results from the Low Carbon and Renewable Energy Survey on the low carbon and renewable energy economy in the UK, including direct and indirect activity, employees and turnover.

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Release date:
31 January 2019

Next release:
To be announced

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1 . Main points

- The UK low carbon and renewable energy (LCRE) economy grew by 6.8% to £44.5 billion in 2017, from £41.7 billion in 2016.
- The number of employees working directly in the LCRE economy in the UK was relatively stable at 209,500 full-time equivalents (FTE) in 2017 compared with 208,300 in 2016.
- Businesses with activity in the energy efficient product group continued to account for almost half of the total LCRE turnover (£20.7 billion) and over two-thirds of LCRE employment (142,100 FTE) in 2017.
- The increase in the LCRE turnover was driven by UK businesses classified within the production of electricity industry, while the increase in the number of employees working directly in the LCRE economy was due mainly to increases within the construction industry.
- The renewable heat sector saw the biggest growth in terms of turnover, to £1.7 billion in 2017 from £0.5 billion in 2016; this was due largely to increased activity in businesses within the production of electricity industry.
- Turnover from onshore wind activity in the UK fell to £2.8 billion in 2017 from £3.3 billion in 2016, driven by a decrease in onshore wind turnover from businesses within the manufacturing and construction industry.
- Exports from the low emissions vehicles sector were £2.8 billion in 2017, over half of total UK LCRE economy exports.

2 . Things you need to know about this release

The low carbon economy is defined as economic activities that deliver goods and services that generate significantly lower emissions of greenhouse gases; predominantly carbon dioxide.

The figures in this bulletin are survey-based estimates. Surveys gather information from a sample rather than from the whole population. The sample is designed to allow for this, and to be as accurate as possible given practical limitations such as time and cost constraints, but results from sample surveys are always estimates and not precise figures. This means that they are subject to some uncertainty. This 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) reported are presented in the datasets to aid interpretation.

In general, changes in the estimates reported in this statistical bulletin between 2015, 2016 and 2017 are not usually greater than the level that is explainable by sampling variability. This means that movements in the estimates should be treated as indicative only. All estimates are reported at current prices so no adjustments have been made to account for the effects of inflation.

Activity in the low carbon and renewable energy (LCRE) economy is spread across a wide range of industries. Many sectors are small but growing and for many businesses LCRE activity is secondary rather than primary. For this reason, estimates of the number of businesses are subject to particular volatility.

A more complete picture of how the LCRE economy is changing over time will be possible once longer-term trends are available. More information on how to interpret the survey estimates is available in Section 10: Accuracy of the statistics.

Regional estimates and country-level data are presented throughout this release. These estimates are based on where the activity takes place, rather than where the business is registered. For example, if a business in England owns a wind farm in Scotland then the activity would be allocated to Scotland. A business could have activity in more than one UK region, for example, a wind farm in Scotland and a wind farm in Wales. In this case, data given for low carbon activity are apportioned for each variable between each region. The method of regional allocation should be taken into consideration when comparing these results with estimates of low carbon activity from other sources, which may be based on where the business is registered.

Estimates of indirect activity in the LCRE economy, which are presented in Section 8, are Experimental Statistics and remain under development.

This release contains revisions to previous figures since they were published in January 2018. This is due mainly to the incorporation of additional data received from businesses that have been sampled in multiple years of the survey. A summary of the effect of revisions can be found in Section 9.

Estimates rely on businesses self-reporting their activity. Where a business is active in the low carbon services sector, if they provide services entirely in relation to another low carbon sector then they may choose to report their estimates there. For example, a business that provides financial services to the onshore wind sector may report their estimates under onshore wind only. Estimates of low carbon financial services may therefore be an underestimate.

3 . How do we measure the low carbon economy?

The low carbon economy is defined as economic activities that deliver goods and services that generate significantly lower emissions of greenhouse gases; predominantly carbon dioxide.

The Low Carbon and Renewable Energy (LCRE) Economy Survey was designed to provide greater detail on the low carbon and renewable energy economy in the UK. The survey was despatched for the fourth time in 2018, for the reporting year 2017, to a sample of around 24,000 businesses. The survey collects information on turnover, imports, exports, employment[1], and acquisitions and disposals of capital assets, for 17 low carbon sectors[2]. For analysis purposes, these 17 sectors can then be aggregated into six[3] groups; results for these groups can be found in the dataset accompanying this bulletin.

Only the portion of a business's economic activity that directly relates to low carbon activities is included. The survey does not collect information on the supply chain involved in low carbon activities; instead, this is estimated by applying multipliers. Experimental estimates of indirect activity related to the low carbon economy can be found in Section 8.

This bulletin discusses estimates from the UK LCRE Economy Survey for 2017 and revised figures for 2016. Results are discussed at the UK and UK country level, followed by analysis of the contribution of specific groups and sectors. Revised figures for 2015 are available in the dataset accompanying this bulletin. The estimates for 2014 have remained unchanged since the last release in January 2018. Finally, we present experimental estimates of indirect activity from the LCRE economy.

Notes for: How do we measure the low carbon economy?

1. Employment is measured in terms of full-time equivalents (FTE). One FTE employee may be thought of as one person working full-time for a year. For example, a person working in a factory who spent 60% of their time working in activities within the low carbon and renewable energy economy (LCRE) solar sector but the rest of their time on other non-LCRE activities within the factory, would be considered as a 0.6 FTE employee in the LCRE solar sector.

2. The low carbon sectors are: offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable energy, bioenergy, alternative fuels, renewable heat, renewable combined heat and power, energy efficient lighting, 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 power, fuel cells and energy storage systems.

3. The low carbon groups are: low carbon electricity, low carbon heat, energy from waste and biomass, energy efficient products, low carbon services, and low emission vehicles (which combines the low emission vehicles and infrastructure with fuel cells and energy storage sectors).

4 . Turnover in the low carbon and renewable energy economy grew faster than employment between 2016 and 2017

In 2017, businesses active in the UK low carbon and renewable energy (LCRE) economy generated £44.5 billion in turnover and employed an estimated 209,500 full-time equivalent (FTE) employees. This was an increase of 6.8% and 0.6% respectively when compared with 2016.

The LCRE economy accounted for around 1% of total UK non-financial turnover and employment in 2017, similar to 2016 and 2015 (Table 1). This figure is slightly higher for Wales, Scotland and Northern Ireland than England and the UK as a whole, suggesting that the LCRE economy is relatively more important in those regions (Table 1).

The energy efficient products group, which is made up of three sectors; energy efficient lighting, energy efficient products, and energy monitoring, saving and control systems, is the largest group within the LCRE economy. This group accounted for almost half of all LCRE turnover and nearly two-thirds of all employees (Figure 1) in 2017.

Turnover (£20.5 billion in 2016 and £20.7 billion in 2017) and employment (143,000 FTEs in 2016 and 142,100 FTEs in 2017) within this group was relatively stable between 2016 and 2017. Despite turnover and employment for the group being stable, the energy efficient products sector, which covers the design, manufacture and installation of energy efficient products, saw an increase in turnover and employment.

The low carbon electricity group, which covers activities related to the production of electricity from nuclear, wind, solar, hydropower and other renewable sources such as tidal or geothermal, remained the second-largest group in 2017 (Figure 1). This group generated £12.3 billion in turnover and employed 32,200 FTEs in 2017, compared with £11.2 billion and 31,800 FTEs in 2016.

The relatively higher ratio of turnover to employment suggests activity in this group is less resource intensive when compared with other groups. This may also explain why employment for this group saw smaller growth than turnover between 2016 and 2017. The increase in turnover within the low carbon electricity group was driven by increases within the offshore wind and nuclear sectors.

Table 1: Low carbon and renewable energy economy, turnover and employment, UK and constituent countries, 2015 to 2017

	Low carbon and renewable energy economy			Percentage of total non-financial business economy activity		
	2015	2016	2017	2015	2016	2017
Turnover (£ billions)						
UK	40.4	41.7	44.5	1.3	1.3	1.2
England	32.4	32.6	35.6	1.2	1.1	1.1
Scotland	5.3	5.5	5.9	2.4	2.6	2.4
Wales	1.8	2.4	1.8	1.8	2.4	1.7
Northern Ireland	0.9	1.1	1.2	1.3	1.5	1.4
Employees UK (FTE)						
UK	202,200	208,300	209,500	0.9	0.9	0.9
England	165,300	165,100	173,000	0.8	0.8	0.8
Scotland	22,100	23,900	21,400	1.2	1.2	1.1
Wales	10,400	12,800	9,300	1.1	1.3	0.8
Northern Ireland	4,400	6,500	5,900	0.9	1.3	1.1

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

Notes

1. Figures may not sum due to rounding. Regional estimates may not sum to UK totals where it was not possible to allocate activity to a region. Back to table

2. The difference between the 2015, 2016 and 2017 estimates should be interpreted with caution due to the precision of survey-based estimates. Back to table

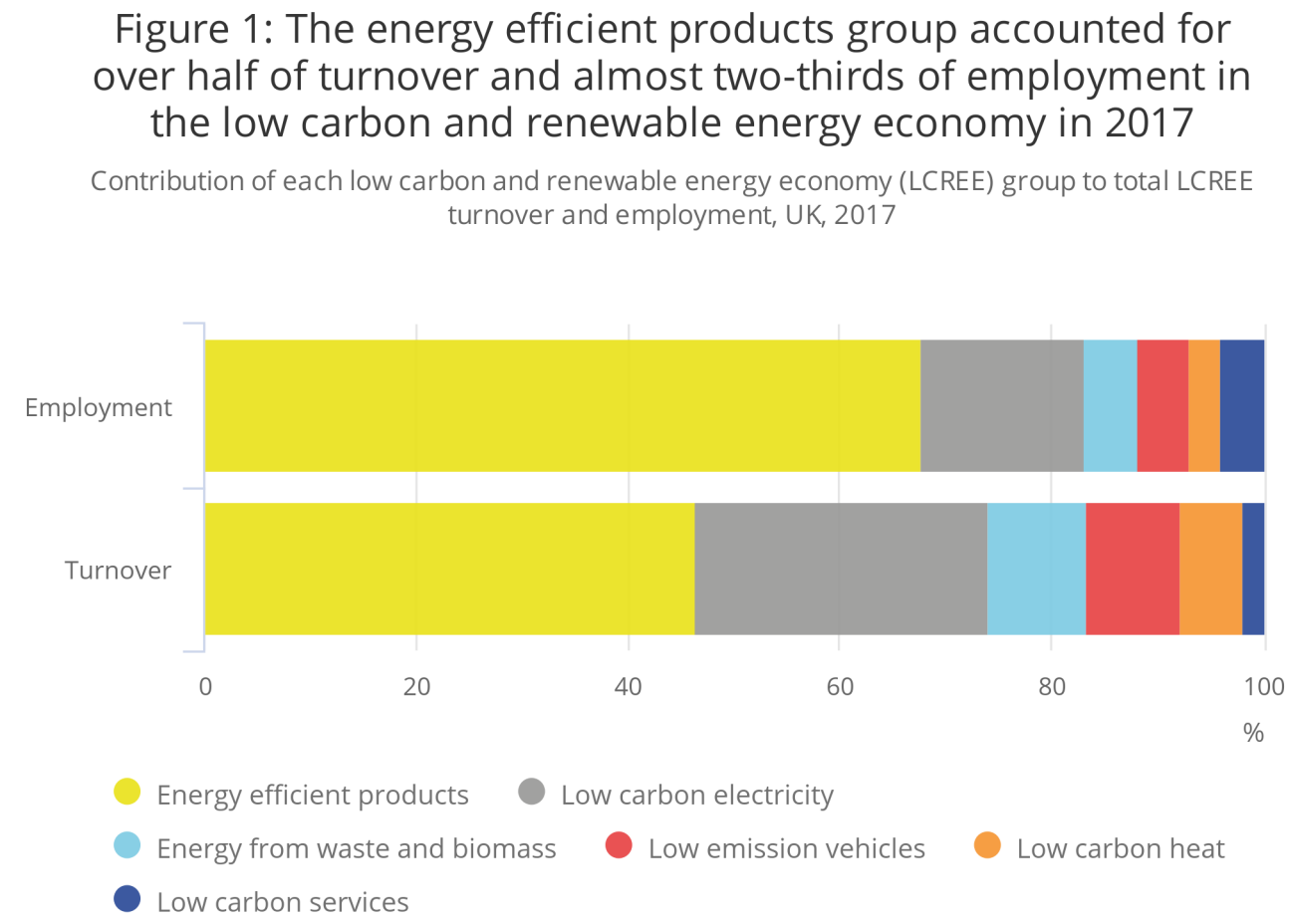
3. Information on the coefficients of variation associated with these estimates can be found in the datasets accompanying this release. Back to table

4. Number of full-time equivalent (FTE) employees is rounded to the nearest 100, all other variables are rounded to the nearest £0.1 billion. Back to table

5. See Section 11: Quality and methodology for details on how the percentage of total UK non-financial business economy activity has been calculated. Back to table

Figure 1: The energy efficient products group accounted for over half of turnover and almost two-thirds of employment in the low carbon and renewable energy economy in 2017

Contribution of each low carbon and renewable energy economy (LCREE) group to total LCREE turnover and employment, UK, 2017



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

Notes:

1. Figures may not sum due to rounding.

2. Information on the coefficient of variation associated with estimates of UK turnover and employment can be found in the datasets accompanying this release.

5 . Turnover from businesses within the production of electricity industry driving growth within the low carbon and renewable energy economy between 2016 and 2017

Businesses classified within manufacturing or construction industries accounted for the largest proportion of the UK low carbon and renewable energy (LCRE) turnover in 2017. Businesses within these industries accounted for £24.6 billion turnover and 140,900 full-time equivalent (FTE) employees, over half of all turnover and over two-thirds of FTE in the LCRE. The majority of turnover and employment within such businesses related to activity within the energy efficient products sector.

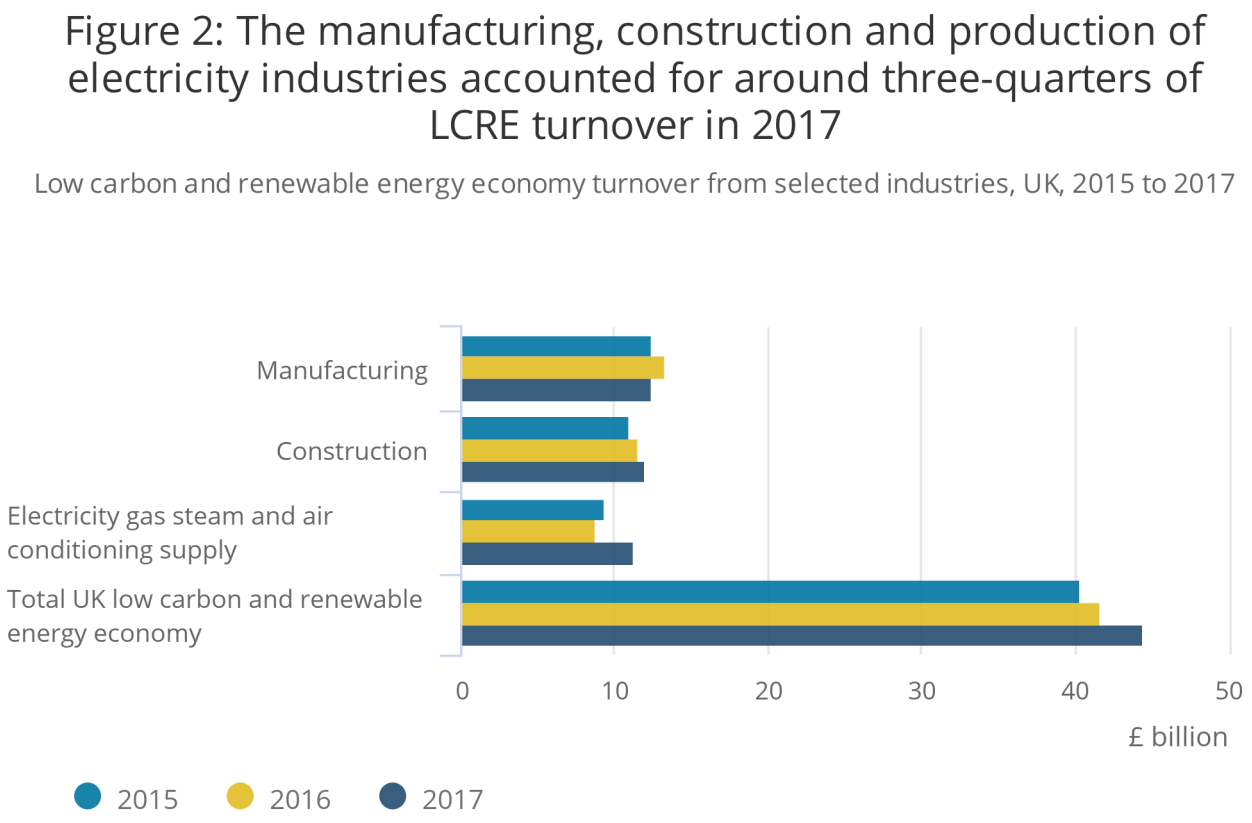
In 2017, the production of electricity industry had the largest turnover in the LCRE economy after the manufacturing and construction industries and showed the largest growth since 2016. UK LCRE turnover from businesses in this industry grew from £8.7 billion in 2016 to £11.3 billion in 2017, an increase of 30%.

Turnover from businesses classified within the production of electricity industry was mainly from the nuclear, bioenergy, offshore and onshore wind LCRE sectors, which can be less labour intensive when compared with other sectors, such as energy efficient products. This is likely to explain why LCRE employment in the production of electricity industry grew more slowly, from 13,500 FTEs in 2016 to 14,100 FTEs in 2017, an increase of 4% (Figures 2 and 3).

UK LCRE employment and turnover from businesses within the construction industry increased by around 8% and 4% respectively from 2016 to 2017. In contrast, employment and turnover from businesses within the manufacturing industry fell by 6% and 10% respectively (Figures 2 and 3).

Figure 2: The manufacturing, construction and production of electricity industries accounted for around three-quarters of LCRE turnover in 2017

Low carbon and renewable energy economy turnover from selected industries, UK, 2015 to 2017



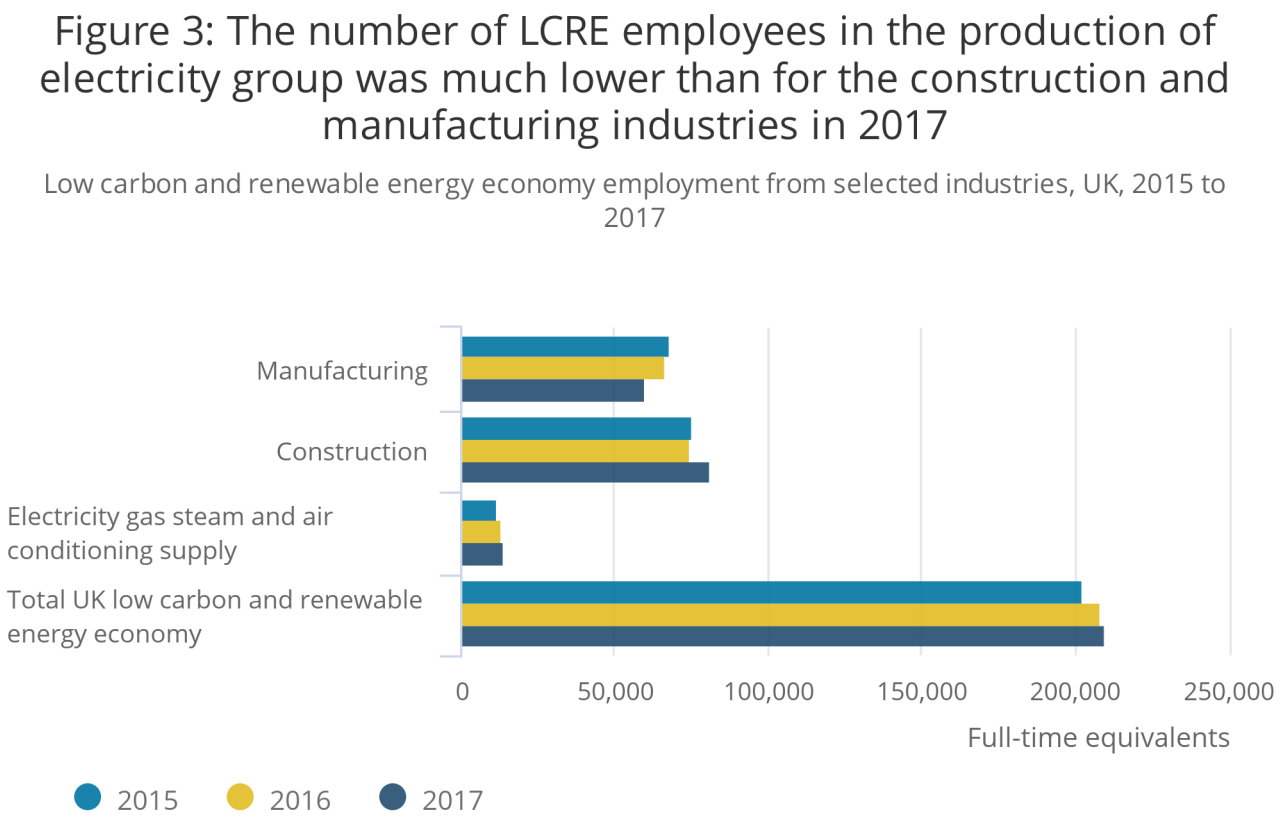
Source: Office for National Statistics - Low Carbon and Renewable Energy Economy Survey

Notes:

1. Information on the coefficient of variation associated with estimates of turnover used to derive this figure can be found in the datasets accompanying this release.

Figure 3: The number of LCRE employees in the production of electricity group was much lower than for the construction and manufacturing industries in 2017

Low carbon and renewable energy economy employment from selected industries, UK, 2015 to 2017



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

Notes:

1. Information on the coefficient of variation associated with estimates of employment used to derive this figure can be found in the datasets accompanying this release.

6 . The renewable energy group accounted for over a third of all low carbon and renewable energy turnover in 2017

This section looks at the low carbon and renewable energy (LCRE) sectors that can be grouped together to represent renewable energy activities. The sectors classified as renewable energy are:

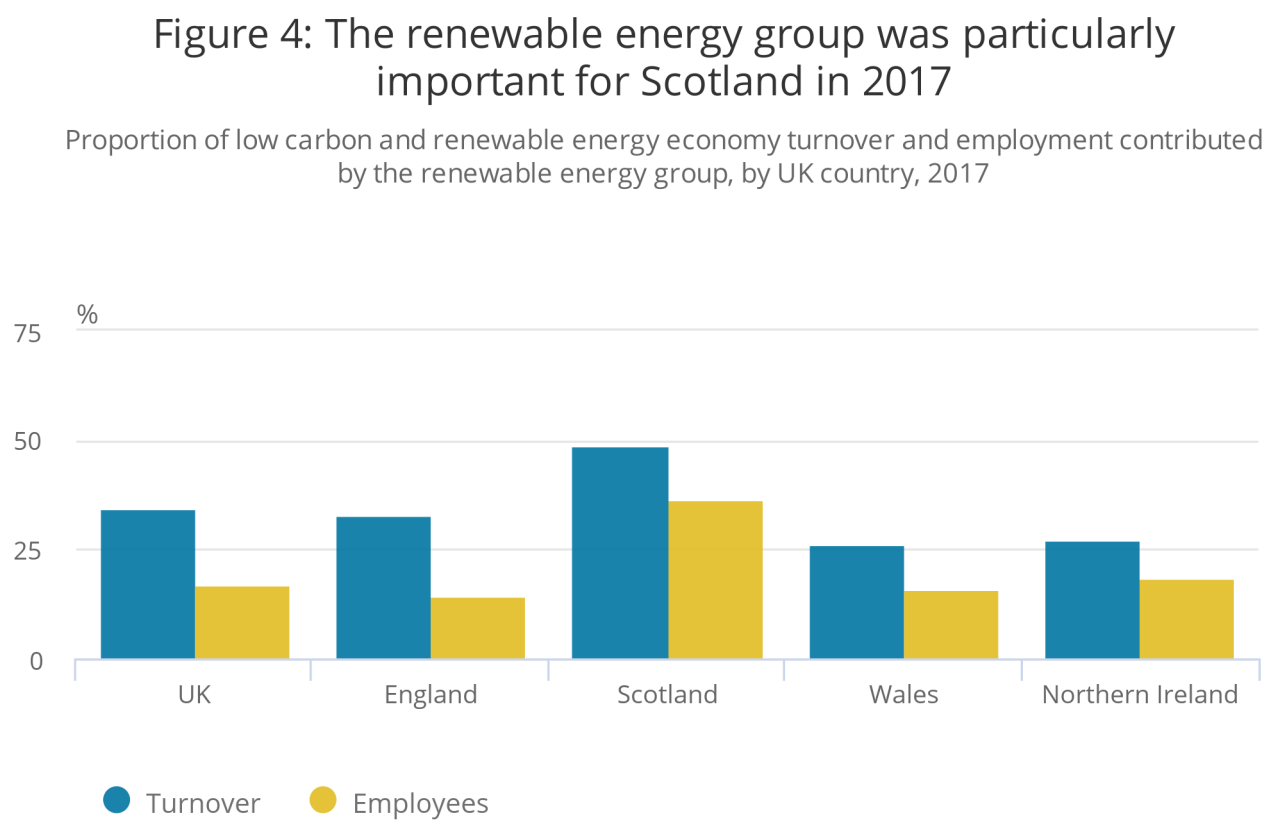
- offshore wind
- onshore wind
- solar photovoltaic
- hydropower
- other renewable energy
- bioenergy
- alternative fuels
- renewable heat
- renewable combined heat and power

The renewable energy group still accounted for over one-third of all UK LCRE turnover and around one-fifth of UK LCRE full-time equivalent (FTE) employees in 2017. Turnover within the renewable energy sector grew by over 10% from £13.8 billion in 2016 to £15.3 billion in 2017. This was due mainly to the renewable heat sector, which saw the largest absolute growth in the UK LCRE turnover between 2016 and 2017, of £1.2 billion. This is a reflection of new businesses investing in activity within this group.

The renewable energy group was still particularly important in Scotland, where it accounted for nearly half of LCRE turnover and over a third of LCRE employment in 2017 (Figure 4).

Figure 4: The renewable energy group was particularly important for Scotland in 2017

Proportion of low carbon and renewable energy economy turnover and employment contributed by the renewable energy group, by UK country, 2017



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

Notes:

1. Information on the coefficient of variation associated with the renewable energy groups' estimates of turnover and employment can be found in the datasets accompanying this release.

The largest contributor to the renewable energy group in terms of turnover was the bioenergy sector; nearly a quarter of the renewable energy group turnover came from this sector in both 2016 and 2017.

The onshore and offshore wind sectors also continued to be large contributors to the renewable energy group in 2017, accounting for a combined 42% of renewable energy turnover (Figure 5). Offshore wind accounted for £3.6 billion (8% of UK LCRE) of turnover and employed 7,200 (3.4% of UK LCRE) FTEs in 2017. The onshore wind sector accounted for £2.8 billion (6.3% of UK LCRE) turnover and employed 5,300 (2.5% of UK LCRE) FTEs in 2017.

Combined, the wind sectors accounted for 14.3% of UK LCRE turnover and 6.0% of UK LCRE FTEs in 2017. The majority (90.5%) of offshore wind turnover in 2017 was generated in England, with most offshore wind farms being located on the coast of England. In contrast, the largest proportion (51.1%) of onshore wind turnover was generated in Scotland in 2017, as the majority of large capacity wind farms are in Scotland.

The onshore and offshore wind sectors saw differing trends between 2016 and 2017. Offshore wind saw an increase in turnover of 35.9%, while turnover for the onshore wind sector fell by 15.1%.

Offshore wind in England grew the most compared with other regions in 2017, increasing by 45% (£1.0 billion). England, Wales and Scotland all saw a decrease in estimates of onshore wind turnover between 2016 and 2017. The majority of the decrease was within the manufacturing and construction industries, which includes installation of wind turbines. The cut in government feed-in tariffs for installing wind turbines may be contributing to the reduction in turnover and employment seen within this sector as a whole.

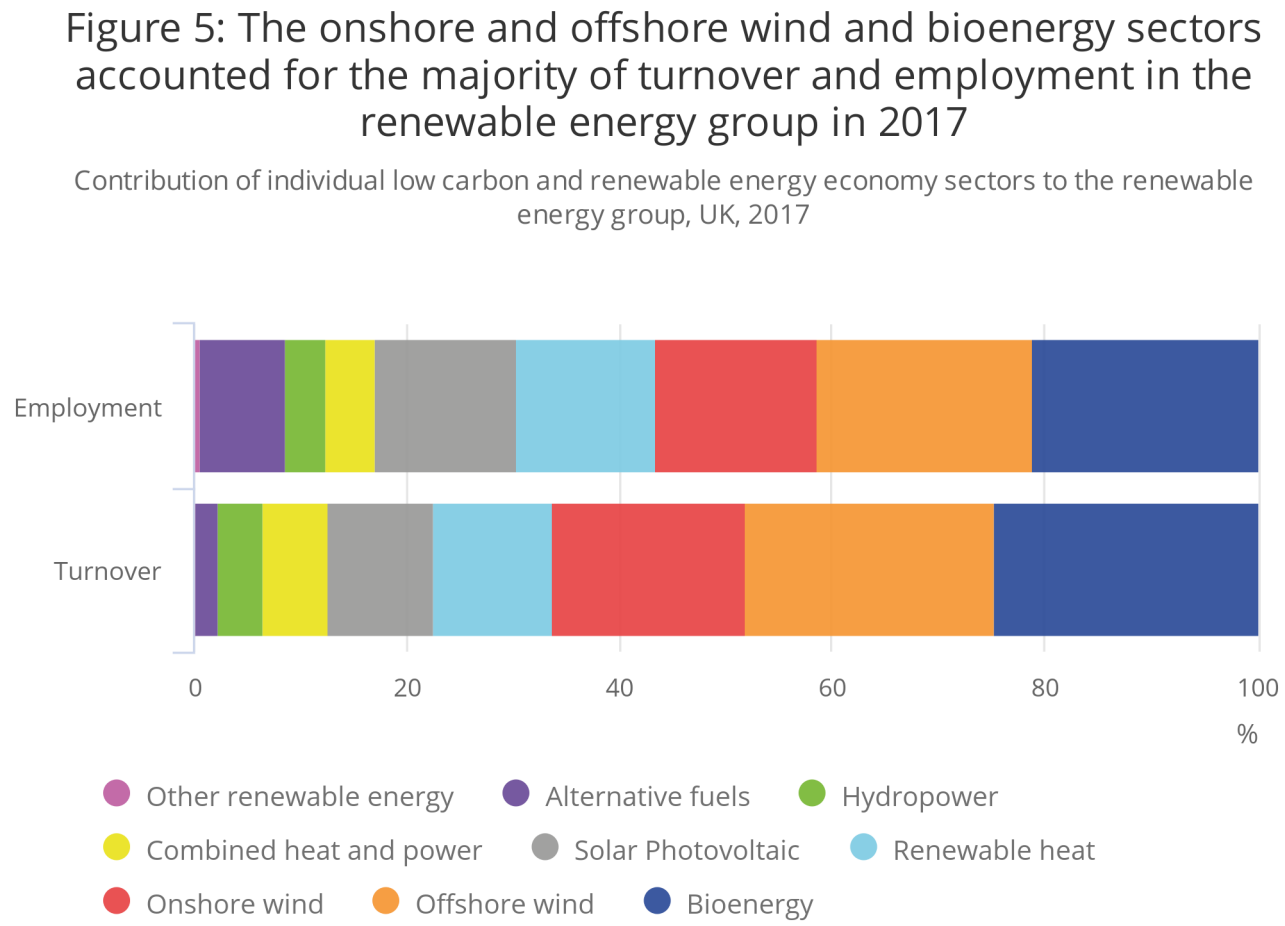
Businesses involved in the production of electricity industry reported an increase in LCRE turnover from onshore wind. This is reflected in the increase in generation of electricity from onshore wind between 2016 and 2017 shown in other sources (PDF, 12.7MB).

UK LCRE employment in onshore wind decreased by 35.3% since 2016, from 8,200 FTE to 5,300 FTE in 2017. The construction, manufacturing and the production of electricity industries had a combined decrease within the onshore wind sector of 2,800 FTEs in 2017, accounting for the majority of the total fall. The onshore wind sector is less resource-intensive than other sectors, such as the energy efficient products sector. Onshore wind construction is often contract-based, therefore when construction of the wind farms is completed, employment for onshore wind may fall.

Activity in the solar sector continued to decrease, with businesses generating £1.5 billion of turnover and employing 4,700 FTEs in 2017, compared with £1.8 billion and 5,200 FTEs in 2016. This fall was due to decreasing activity in England, Scotland and Wales. The drop in the total LCRE turnover for solar is likely to be due partly to government subsidies relating to solar that have been gradually reduced since early 2016.

Figure 5: The onshore and offshore wind and bioenergy sectors accounted for the majority of turnover and employment in the renewable energy group in 2017

Contribution of individual low carbon and renewable energy economy sectors to the renewable energy group, UK, 2017



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

Notes:

1. Information on the coefficient of variation associated with individual sectors' estimates of turnover and employment can be found in the datasets accompanying this release.

7 . Exports from the UK low carbon and renewable energy economy grew to £5.0 billion in 2017

Exports of goods and services by businesses active in the UK low carbon and renewable energy (LCRE) economy were an estimated £5.0 billion in 2017, compared with £3.8 billion in 2016 (Table 2). This growth of almost 30% was driven by an increase in exports within the low emission vehicles and offshore wind sectors. The low emission vehicles group accounted for 55.9% (£2.8 billion) of the UK LCRE economy exports in 2017.

Imports by businesses active in the UK LCRE economy were estimated to be £5.9 billion in both 2016 and 2017. Import activity was more evenly spread across the six LCRE groups, with the energy efficient products and low emission vehicles groups being the largest contributors to the total in 2017, accounting for £1.9 billion and £1.7 billion respectively.

LCRE active businesses acquired £5.6 billion of capital assets in 2017, a decrease of £3.0 billion compared with 2016. Of LCRE economy acquisitions in 2017, businesses active in the low carbon electricity group made acquisitions worth £3.8 billion. The main sectors with acquisitions within this group were offshore and onshore wind, where acquisitions by businesses active in either of these sectors accounted together for £2.6 billion.

Despite these sectors contributing to nearly half of all LCRE acquisitions, there was a decline in the investment of capital assets in offshore and onshore wind by £1.5 billion and £1.0 billion respectively over this period. Acquisitions in these sectors can be volatile as they include purchases of land for wind farms and one-off large costs.

Table 2: Low carbon and renewable energy economy exports, imports, acquisitions and disposals, UK, 2015 to 2017

	£ billions		
	2015	**2016**	**2017**
Exports	3.7	3.8	5.0
Imports	4.4	5.9	5.9
Acquisitions	5.4	8.6	5.6
Disposals	0.4	0.4	0.2

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

Notes

1. The difference between the 2015 Back to table
2. 2016 and 2017 estimates should be interpreted with caution due to the precision of survey-based estimates., Information on the coefficients of variation associated with these estimates can be found in the datasets accompanying this release. Back to table

8 . Direct and indirect activity in the low carbon and renewable energy economy generated £79.6 billion turnover in 2017

This section uses an experimental methodology to estimate indirect turnover and employment generated by the low carbon and renewable energy (LCRE) economy.

The UK Statistics Authority's Code of Practice for Statistics defines Experimental Statistics as "new official statistics undergoing evaluation. They are published in order to involve users and stakeholders in their development and as a means to build in quality at an early stage."

The data contained in this section have undergone the same high levels of quality assurance as other official statistics. However, as Experimental Statistics, the methodology used to create them remains under development and may be revised following further evaluation. It is therefore recommended that this is taken into account when using the findings.

Multipliers are used to estimate levels of indirect activity. As with the direct estimates, the difference between the 2017, 2016 and 2015 estimates should be interpreted with caution due to the precision of the survey-based estimates. For more information, see Section 10: Accuracy of the statistics.

What is indirect activity?

Most economic transactions increase economic activity by a larger amount than their size – this is because any transaction results in an increase in another economic actor's income or demand for an input, which in turn results in an increase in their spending, or investment. Multipliers are used to estimate the indirect effect an economic activity has on the wider economy, such as additional activity due to demand generated for the products of other firms by the wages paid to employees, or the increase in demand for the inputs used. A multiplier effect is the impact an economic transaction has on the wider economy; the multiplier measures the overall increase in economic activity resulting from the transaction, proportional to its size.

The total activity estimates in this report were calculated by constructing multipliers for each LCRE sector, both for the UK as a whole and for each UK country, based on the sector's composition in terms of Standard Industrial Classification 2007: SIC 2007 and the corresponding multipliers for turnover and employment. The latest available multipliers were published in 2018, referencing 2014. Turnover and employment for each region, group and sector were multiplied by the corresponding multipliers to yield an estimate of total activity generated, including both direct and indirect activity. The difference between the direct activity discussed in this bulletin and the calculated total estimate is the indirect activity. Further details of the methodology are provided in Section 11: Quality and methodology.

Estimates of indirect turnover and employment

In the UK in 2017, an estimated £79.6 billion turnover was generated directly and indirectly by businesses active in the low carbon and renewable energy (LCRE) economy, compared with £73.6 billion turnover in 2016 and £71.8 billion turnover in 2015. Of the total LCRE turnover generated in 2017, indirect activities generated £35.1 billion (44.1%) (Table 3).

LCRE businesses accounted for a total of 396,200 full-time equivalent (FTE) employees in 2017, compared with 390,600 in 2016 and 377,300 in 2015. Of the total LCRE employment in 2017, indirect activities contributed 47.1% (Table 4).

Table 3: Estimates of direct and indirect turnover in the low carbon and renewable energy economy, UK and constituent countries, 2015 to 2017

	£ billions								
	2015			2016			2017		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
UK	40.4	31.4	71.8	41.7	31.9	73.6	44.5	35.1	79.6
England	32.4	24.8	57.2	32.6	24.5	57.2	35.6	27.8	63.4
Scotland	5.3	4.7	10.1	5.5	4.9	10.4	5.9	5.2	11.1
Wales	1.8	1.2	3.0	2.4	1.8	4.2	1.8	1.3	3.1
Northern Ireland	0.9	0.6	1.5	1.1	0.7	1.8	1.2	0.8	2.0

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

Notes

1. Figures may not sum due to rounding. Regional estimates may not sum to UK totals where it was not possible to allocate activity to a region. Back to table

2. The methods used to calculate indirect activity are experimental. The methods used to calculate indirect activity are experimental. Consequently, percentage change in total estimates of turnover between 2015 and 2017 should be treated with caution. Back to table

3. Turnover is rounded to the nearest £0.1 billion. Back to table

Table 4: Estimates of direct and indirect employment in the low carbon and renewable energy economy, UK and constituent countries, 2015 to 2017

	Full-time equivalents (FTEs)								
	2015			2016			2017		
	Direct	Indirect	Total	Direct	Indirect	Total	Direct	Indirect	Total
UK	202,200	175,100	377,300	208,300	182,300	390,600	209,500	186,700	396,200
England	165,300	137,400	302,600	165,100	139,400	304,500	173,000	148,200	321,200
Scotland	22,100	23,700	45,800	23,900	26,600	50,500	21,400	25,000	46,400
Wales	10,400	9,200	19,600	12,800	10,500	23,300	9,300	7,700	16,900
Northern Ireland	4,400	4,800	9,200	6,500	5,800	12,300	5,900	5,900	11,700

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

Notes

1. Figures may not sum due to rounding. Regional estimates may not sum to UK totals where it was not possible to allocate activity to a region. Back to table

2. The methods used to calculate indirect activity are experimental. Consequently, percentage change in total estimates of full-time equivalent (FTE) employment between 2015 and 2017 should be treated with caution. Back to table

3. Number of full-time equivalent (FTE) employees rounded to the nearest 100. Back to table

The pattern of total activity across UK country and low carbon sector is the same as was seen in the direct estimates, which are discussed in the main body of this publication. The reason for this is that the multipliers are calculated by SIC 2007 and within each low carbon sector there is often a wide range of SICs. This means that the effect of applying the multipliers is fairly consistent across sectors and UK country. Estimates for indirect and total activity by UK country, sector and group can be found in the Low carbon and renewable energy economy indirect estimates dataset.

9 . Revisions

This release contains revisions to 2015 and 2016 estimates since they were published in January 2018. 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 5 shows the effect of revisions to 2016 data on direct estimates of UK turnover, employment, imports, exports, acquisitions and disposals. Revisions have also been made to 2015 data, these were of less than 1% in magnitude at a UK level. In line with our revisions policy, revisions resulting from additional data are made only to the previous two years estimates. As such, revisions have not been made to 2014 direct estimates.

Revisions to previous indirect estimates and therefore estimates of total activity, for 2014 to 2017 have been made in this release due to the availability of updated multipliers since the previous release (Section 8). The difference in the current and previous 2015 and 2016 indirect and total estimates will be as a result of changes to the direct estimates and the use of these new multipliers.

Revisions may continue to be made to the entire time series of direct and indirect estimates if the survey methodology changes in future.

Table 5: Revisions to Low Carbon and Renewable Energy Survey estimates, UK, 2016

	Latest estimate	Previously published estimate	Percentage change
Turnover (£ billions)	41.7	42.6	-2.1
Employment (FTE)	208,300	208,000	0.1
Imports (£ billions)	5.9	6.0	-1.4
Exports (£ billions)	3.8	3.7	3.0
Acquisitions (£ billions)	8.6	8.6	-0.6
Disposals (£ billions)	0.4	0.4	-0.1

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

Notes

1. Number of full time equivalent (FTE) employees is rounded to the nearest 100 Back to table
2. All other variables are rounded to the nearest £0.1 billion. Back to table

10 . Accuracy of the statistics: estimating and reporting uncertainty

The figures in this bulletin are survey-based estimates. Surveys gather information from a sample rather than from the whole population. The sample is designed to allow for this and to be as accurate as possible given practical limitations such as time and cost constraints, but results from sample surveys are always estimates and not precise figures. This means that they are subject to some uncertainty. This 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) reported are presented in the datasets to aid interpretation.

The coefficient of variation (CV) is the ratio of the standard error of an estimate to the estimate itself. For example, an estimate with a CV of 5% will have a standard error that is 5% of the estimate. The smaller the coefficient of variation the greater the accuracy of the estimate. A rough guide to CVs is that a CV of less than 5% is very good, of less than 10% is good, and of less than 20% is acceptable. Estimates with a CV greater or equal to 20% should be used with caution. In general, changes in the estimates reported in this statistical bulletin between 2016 and 2017 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.

11 . Quality and Methodology

The Low Carbon and Renewable Energy Economy Survey Quality and Methodology Information report contains important information on:

- the strengths and limitations of the data and how it compares with related data
- uses and users of the data
- how the output was created
- the quality of the output including the accuracy of the data

The 2017 Low Carbon and Renewable Energy Economy Survey

The Low Carbon and Renewable Energy (LCRE) Economy Survey was despatched for the fourth time in 2018, for the reporting year 2017, to a sample of 23,939 businesses. The sample size in 2016 was smaller, at 13,884. It achieved a response rate of 82.6% and of those responding, 2,850 businesses were operating in the LCRE sectors captured by the survey. We designed the survey to provide greater detail on the low carbon and renewable energy economy in the UK. Results from the survey can be used to show business activity in six low carbon groups, which can be further subdivided into 17 low carbon sectors (see the QMI report for more information).

Estimates for 2014 are provided in the datasets accompanying the statistical bulletin only. Comparing estimates from 2014 with estimates from later years of the survey is not advised due to changes in the sample methodology that were implemented 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 LCRE economy were selected to be included in the sample. Because these businesses were not selected through random sampling for the 2015 sample, 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 LCRE economy are generally lower in 2015 compared with 2014.

Business counts

Activity in the LCRE economy is spread across a wide range of industries. Many sectors are small but growing and for many businesses, LCRE 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.

The method used to calculate business counts for sectors within the LCRE economy was changed since the publication of 2014 final estimates in May 2016. Previously, businesses were apportioned to each sector that they were active in. For example, if a business was active in three sectors then it counted as one-third of a business in each sector. The benefit of this was that the sum of businesses in each sector added up to the UK total number of businesses. However, this potentially resulted in an underestimate of the number of businesses active within a particular sector.

This methodology, used since the release of 2015 estimates in April 2017, means that if a business is active in three sectors, it counts as one business within each sector. This means that when the number of businesses is summed across all the sectors, the total may be more than the UK total number of businesses. This methodology has been applied to the 2014, 2015 and 2016 figures released alongside this bulletin. The method used to calculate the UK total number of businesses within the LCRE economy is unchanged since the survey began.

UK non-financial business economy

Total turnover, acquisitions and disposals in the UK non-financial business economy are derived from the Annual Business Survey, UK non-financial business economy, 2017 provisional results. The Annual Business Survey (ABS) excludes the following agricultural industries:

- 01.1 growing of non-perennial crops
- 01.2 growing of perennial crops
- 01.3 plant production
- 01.4 animal production
- 01.5 mixed farming

These industries were included in the LCRE Economy Survey and are included in the LCRE survey results. This should be considered when making comparisons. At the time of writing, regional ABS results for 2017 were not available. Therefore, 2015 ABS regional data have been used to derive proportions, which have then been applied to the UK 2016 total.

Regional full-time equivalent (FTE) non-financial business economy estimates are derived from the Business Register Employment Survey (BRES) and the Northern Ireland Quarterly Employment Survey (QES). Figures for Great Britain derived from BRES exclude employees in all industries that are excluded from the LCRE survey. However, figures for Northern Ireland derived from the QES do include employees in the industries: 63 information service activities, and 95 repair of computers and personal and household goods. This should be considered when making comparisons.