

Statistical bulletin

# UK environmental accounts: Low carbon and renewable energy economy survey, final estimates: 2015

Final results of direct and indirect activity from the UK Low Carbon and Renewable Energy Economy Survey (UK LCRE) for the reporting year 2015. The survey provides details of the low carbon and renewable energy economy in the UK.

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# 1 . Main points

- In 2015, an estimated 234,000 full-time equivalent (FTE) employees were working directly in low carbon and renewable energy (LCRE) activities in the UK, accounting for 1.0% of total UK non-financial employees.
- LCRE activities generated £43.1 billion turnover in 2015, accounting for 1.3% of total UK non-financial turnover.
- Sectors active in renewable energy generated £14.9 billion in turnover in 2015, which is 34.7% of all LCRE turnover.
- The energy efficient products sector accounted for a third of LCRE turnover (£13.9 billion) and almost half of LCRE employment (102,500 FTE).
- Over half (52.9%) of the UK's turnover from onshore wind activities was generated in Scotland (£1.5 billion).
- The solar, offshore and onshore wind sectors combined accounted for 63.5% of all LCRE acquisitions in 2015.

## 2 . Things you need to know about this release

The figures in this bulletin are survey-based estimates. This means that they are subject to a margin of error, which can have an impact on how changes in the estimates should be interpreted. Estimates of the margins of error ("confidence intervals") around the 2014 and 2015 figures are presented in the datasets to aid interpretation.

It is not possible to directly assess whether or not the observed differences between the 2014 and 2015 estimates are likely to represent statistically significant change. Given the margin of error around the two sets of estimates, the size and potential causes of observed year-on-year change are therefore not directly reported within the text of this bulletin or in the datasets. Similarly, the smaller low carbon and renewable energy (LCRE) sectors, particularly at the regional level, are not discussed. 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. 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 these estimates is available in Section 10: Accuracy of the statistics.

This release contains revisions to 2014 and 2015 figures since they were [first published in December 2016](#). These revisions result from a variety of factors, including:

- the incorporation of additional data from responses received and processed since the last publication
- amendment or removal of incorrect data identified through additional editing
- improvement of methodology, such as the introduction of unit level imputation for larger businesses

Regional estimates at country level 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. This should be taken into consideration when comparing these results to estimates of low carbon activity from other sources, which may be based on where the business is registered.

The method used to calculate business counts for sectors within the LCRE economy has changed since the publication of the [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 a 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.

The methodology now used 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 new methodology has been applied to both 2014 and 2015 figures presented in the datasets associated with this bulletin.

The method used to calculate the UK total number of businesses within the low carbon and renewable energy economy is unchanged.

Due to the nature of the LCRE economy, which comprises a relatively large number of small businesses across a range of industries, estimates of the number of businesses are subject to particular volatility, meaning care should be taken in their interpretation.

### **3 . How do we measure the low carbon and renewable energy 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 second time, in 2016 for the reporting year 2015, to a sample of around 14,000 businesses. The survey collects information on turnover, imports, exports, employment, and acquisitions and disposals of capital assets, for 17 low carbon sectors. For analysis purposes, these 17<sup>1</sup> sectors can then be aggregated into six<sup>2</sup> groups; results for these groups can be found in the [datasets](#).

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. The indirect estimates of the low carbon economy can be found in Section 9. This bulletin presents final estimates from the UK LCRE Economy Survey for 2015 and revised figures for 2014. Results are discussed at the UK and UK country level, followed by the renewable energy group and spotlight analysis on four LCRE sectors: energy efficient products, solar, onshore wind and offshore wind. Finally we present estimates of indirect activity from the LCRE economy.

#### **Notes for: How do we measure the low carbon and renewable energy economy?**

1. 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.
2. 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 . The low carbon and renewable energy economy generated £43.1 billion in turnover in 2015**

In 2015, businesses active in the low carbon and renewable energy (LCRE) economy generated £43.1 billion in turnover, compared with £44.2 billion in 2014 (Table 1). The LCRE economy accounted for 1.3% of total UK non-financial turnover in 2015, unchanged from 2014. The energy efficient products sector, which covers the design, manufacture and installation of energy efficient products, is the largest sector within the LCRE economy. In 2015, this sector generated £13.9 billion in turnover, accounting for over a third of all LCRE turnover. Excluding the energy efficient products sector, total turnover for the LCRE economy was estimated to be £28.1 billion in 2014, compared with £29.2 billion in 2015.

LCRE activities resulted in the employment of an estimated 234,000 full-time equivalent<sup>1</sup> (FTE) employees in 2015, accounting for 1 in 100 of total UK FTE employees in the non-financial business economy. The energy efficient products sector also generated the highest employment within the LCRE economy. In 2015, over 100,000 FTE employees were active in the energy efficient products sector, approximately half of all employees within the LCRE economy. All other sectors within the LCRE economy resulted in the employment of an estimated 131,500 FTE employees in 2015, compared with 116,000 in 2014. Further analysis of the energy efficient products sector can be found in Section 7.

Businesses active in the LCRE economy in 2015 imported an estimated £4.7 billion and exported an estimated £4.1 billion, accounting for 0.9% of total UK non-financial businesses economy activity for both imports and exports. In 2015, LCRE businesses acquired £5.7 billion in capital assets<sup>2</sup> and generated £0.4 billion from disposals of capital assets. The largest proportion of acquisitions were in the solar sector (£1.6 billion), closely followed by the onshore wind sector (£1.3 billion). In contrast the largest proportion of disposals was in the offshore wind sector (£0.2 billion).

**Table 1: Low carbon and renewable energy economy, UK, 2014 and 2015**

	Low carbon and renewable energy economy		Percentage of total UK non-financial business economy activity
	2014	2015	2015
Turnover (£ thousands)	44,223,000	43,087,000	1.3
Employees (FTE)	238,000	234,000	1.0
Imports (£ thousands)	5,717,500	4,688,000	0.9
Exports (£ thousands)	4,488,500	4,113,500	0.9
Acquisitions (£ thousands)	8,198,000	5,658,000	3.1
Disposals (£ thousands)	352,000	405,000	1.3

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

Notes:

1. The difference between the 2014 and 2015 estimates should be interpreted with caution due to the precision of the survey-based estimates.
2. Number of employees rounded to the nearest 500, all other variables rounded to nearest £500,000.
3. The 2015 disposals estimate should be treated with caution due to the high CV.
4. See Section 11: Quality and Methodology for details on how the percentage of total UK-non-financial business economy activity has been calculated.
5. Information on the confidence intervals around these estimates can be found in the reference tables.

## Notes for: The low carbon and renewable energy economy generated £43.1 billion in turnover in 2015

1. One FTE employee may be thought of as one person per year. For example, a person who normally spends 30% of their time in one sector and rest in other sectors should be considered as 0.3 FTE employee.
2. Defined as capital assets that are used repeatedly to facilitate production, or provide services, for more than one year. It includes non-produced assets such as patents, contracts and domain names. Existing buildings and structure for own use, or where the respondent is responsible for maintenance, are also included. Further information on what is included in the capital assets definition can be found in the questionnaire.

## 5 . How does each UK country contribute to the low carbon and renewable energy economy?

In 2015, England accounted for 81.0% (£34.9 billion) of the turnover in the UK low carbon and renewable energy (LCRE) economy (Table 2). LCRE activity in Scotland generated £5.5 billion in turnover, 12.8% of total UK LCRE turnover. LCRE activity in Wales and Northern Ireland generated £1.7 billion (4.0%) and £1.0 billion (2.2%) in turnover respectively.

In 2015, the low carbon and renewable energy economy resulted in the employment of 187,000 full-time equivalent (FTE) employees in England, 79.9% of all LCRE employees. Employment in LCRE activities in England accounted for 0.9% of the total non-financial employees in England while the LCRE employment in Scotland accounted for 1.6% of the total non-financial employees in Scotland. In 2015, there were 11,000 FTE employees engaged in LCRE activities in Wales (1.2% of total non-financial employees in Wales) and an estimated 5,000 FTE employees in Northern Ireland (1.2% of total non-financial employees in Northern Ireland).

**Table 2: Low carbon and renewable energy economy, UK countries, 2015**

	Percentage of UK LCRE total	
	2015	2015
<b>Number of businesses</b>		
UK	125,500	
England	110,500	88.0
Scotland	20,000	15.9
Wales	4,500	3.6
Northern Ireland	4,000	3.2
<b>Turnover (£ thousands)</b>		
UK	43,087,000	
England	34,901,000	81.0
Scotland	5,505,500	12.8
Wales	1,726,500	4.0
Northern Ireland	954,000	2.2
<b>Employment</b>		
UK	234,000	
England	187,000	79.9
Scotland	31,000	13.2
Wales	11,000	4.7
Northern Ireland	5,000	2.1

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

Notes:

1. The sum of the businesses active in each region may equate to more than the UK total as a business can be active in more one than one country, the same applies to the percentage of UK LCRE activity.
2. Estimates of business counts should be treated with caution due to unexpected volatility in the figures following a reduction in the survey sample size between 2014 and 2015.
3. Figures for turnover and employment may not sum due to rounding.
4. These estimates are based on the country that a business's activity is in, rather than where the business is registered. For example, if a company based in England owns a solar farm in Scotland then their activity will be included in the estimates for Scotland.
5. Estimates for businesses in Northern Ireland should be treated with caution due to the high CV.
6. Estimates by UK country for imports, exports, acquisitions and disposals can be found in the reference table.

## 6 . How does renewable energy contribute to the low carbon and renewable energy economy?

This section looks at nine of the low carbon and renewable energy (LCRE) sectors, which 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 and renewable combined heat and power.

**Table 3: Renewable energy group turnover and employees, UK and UK country, 2015**

	<b>Turnover (£ thousands)</b>	<b>Employees (FTE)</b>
UK	14,949,500	48,000
England	11,352,500	31,500
Scotland	2,730,000	14,500
Wales	544,500	1,500
Northern Ireland	322,500	1,000

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

Notes:

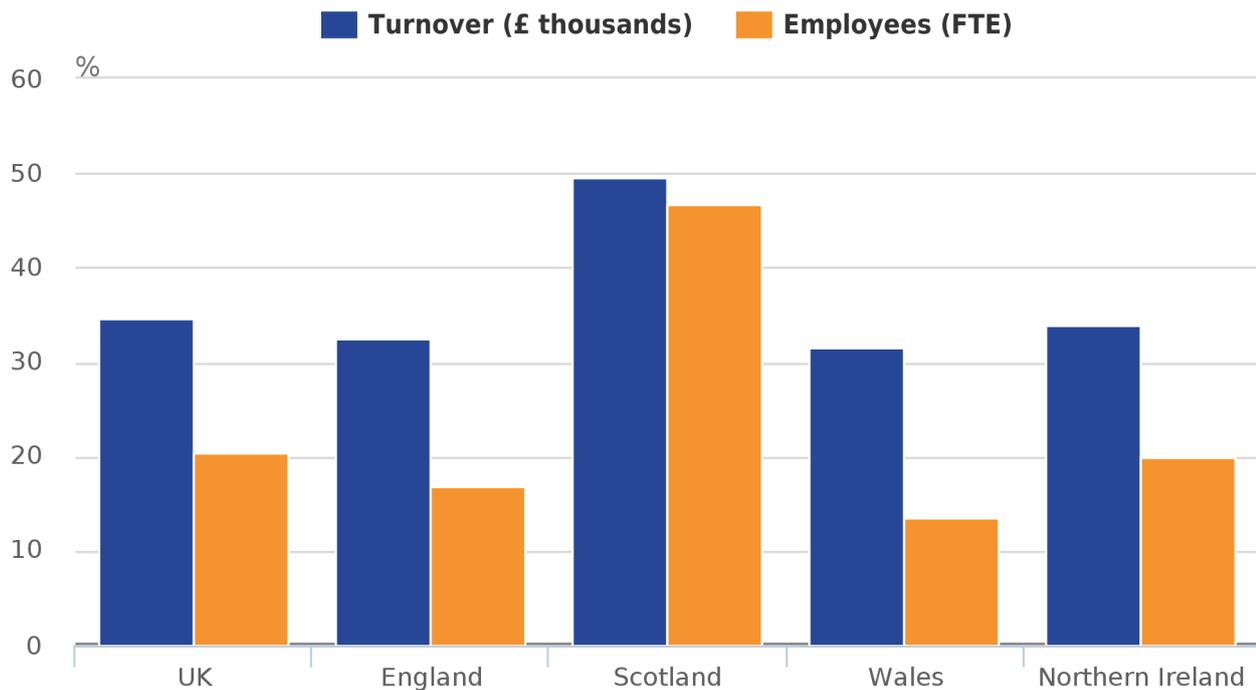
1. Figures may not sum due to rounding.
2. The employment estimate for Scotland should be treated with caution due to a high CV.
3. Information on the confidence intervals around these estimates as well as the corresponding 2014 estimates can be found in the reference tables.

In 2015, the renewable energy group accounted for 34.7% of all UK LCRE turnover (Figure 1), with the bioenergy sector accounting for the greatest proportion (34.9%) of this. In Scotland, the renewable energy group generated almost half of all LCRE turnover generated in Scotland, with over half of this turnover being generated by the onshore wind sector.

The renewable energy sectors contributed around one in five of UK LCRE full-time equivalent (FTE) employees. The proportion is lower than for turnover, reflecting the fact that electricity production does not require as many employees as activities such as production or installation.

**Figure 1: Proportion of low carbon and renewable energy economy turnover and employment accounted for by the renewable energy group, UK and UK country**

2015



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

## 7 . In 2015, the energy efficient products sector employed 43.8% of low carbon and renewable energy employees

The energy efficient products sector covers a wide range of low carbon and renewable energy (LCRE) activities. These include the design, production and/or installation of doors and windows, heating and ventilation, insulation, and sustainable buildings and architecture.

In the UK in 2015, businesses with activity in the energy efficient products sector generated more turnover and resulted in more full-time equivalent (FTE) employment in the LCRE economy than any other LCRE sector (Figure 2). Turnover for the energy efficient products sector was £13.9 billion, around a third of all LCRE turnover (Table 4). The proportion of employees in the LCRE economy who were active in the energy efficient products sector was higher, at just under 45%. This is because, compared with other LCRE sectors such as solar, activities in the energy efficient products sector are relatively labour intensive.

**Table 4: Contribution of the energy efficient products sector to the UK low carbon and renewable energy economy, 2015**

	2015	% LCRE total
Turnover (£ thousands)	13,901,500	32.3
Employees (FTE)	102,500	43.8
Imports (£ thousands)	1,451,500	31.0
Exports (£ thousands)	807,500	19.6
Acquisitions (£ thousands)	580,000	10.3
Disposals (£ thousands)	56,500	14.0

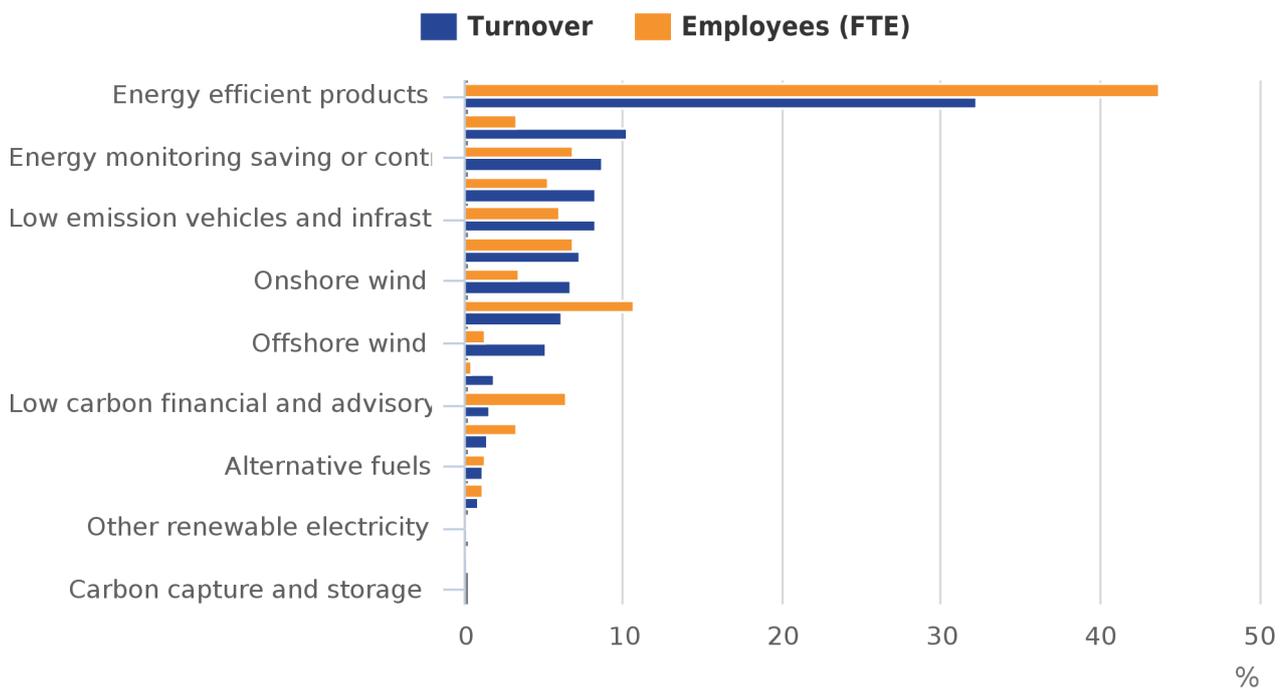
Source: Office for National Statistics, Low Carbon and Renewable Energy Economy Survey

Notes:

1. The estimate for disposals should be treated with caution due to a high CV.
2. Information on the confidence intervals around these estimates as well as the corresponding 2014 estimates can be found in the reference tables.

**Figure 2: Proportion of UK low carbon and renewable energy economy turnover and employment contributed by each low carbon and renewable energy sector**

2015



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

The energy efficient products sector imported the largest amount of all the LCRE economy sectors, accounting for around one-third (£1.5 billion) of all UK LCRE economy imports. This is a result of businesses importing materials and equipment used to install or manufacture energy efficient products as part of their business activity. This sector was the second largest sector for LCRE economy exports, accounting for almost one-fifth (£0.8 billion) in 2015. The largest proportion of LCRE economy exports occurred in the low emission vehicles sector, which accounted for 58.7% of all UK LCRE economy exports, equivalent to £2.4 billion.

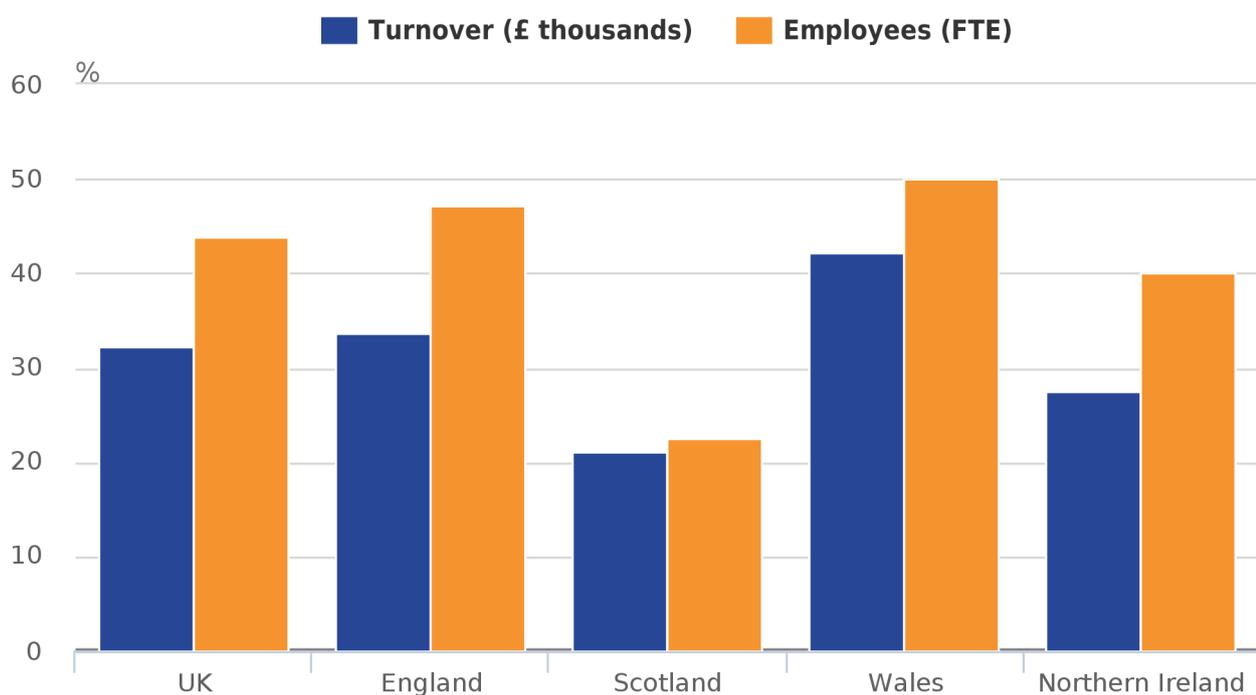
The energy efficient products sector purchased £0.6 billion in capital acquisitions in 2015, amounting to 10.3% of the UK LCRE economy total acquisitions. These purchases were likely for machinery and equipment, which was used to facilitate production and installation of the products.

In England and Wales, the greatest percentage of LCRE turnover was generated in the energy efficient products sector, with 33.7% (£11.8 billion) and 42.1% (£0.7 billion) respectively (Figure 3). In Scotland and Northern Ireland, the energy efficient products sector was the second largest contributor to LCRE turnover, accounting for 21.0% (£1.2 billion) and 27.4% (£0.3 billion) respectively.

Businesses operating in the energy efficient products sector employed 43.8% of FTE employees in the UK LCRE economy in 2015. This sector accounted for the highest percentage of LCRE economy FTE employees for all UK countries except Scotland, where it was the second highest contributor.

**Figure 3: Contribution of the energy efficient products sector to low carbon and renewable energy economy turnover and employment, UK country**

2015



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

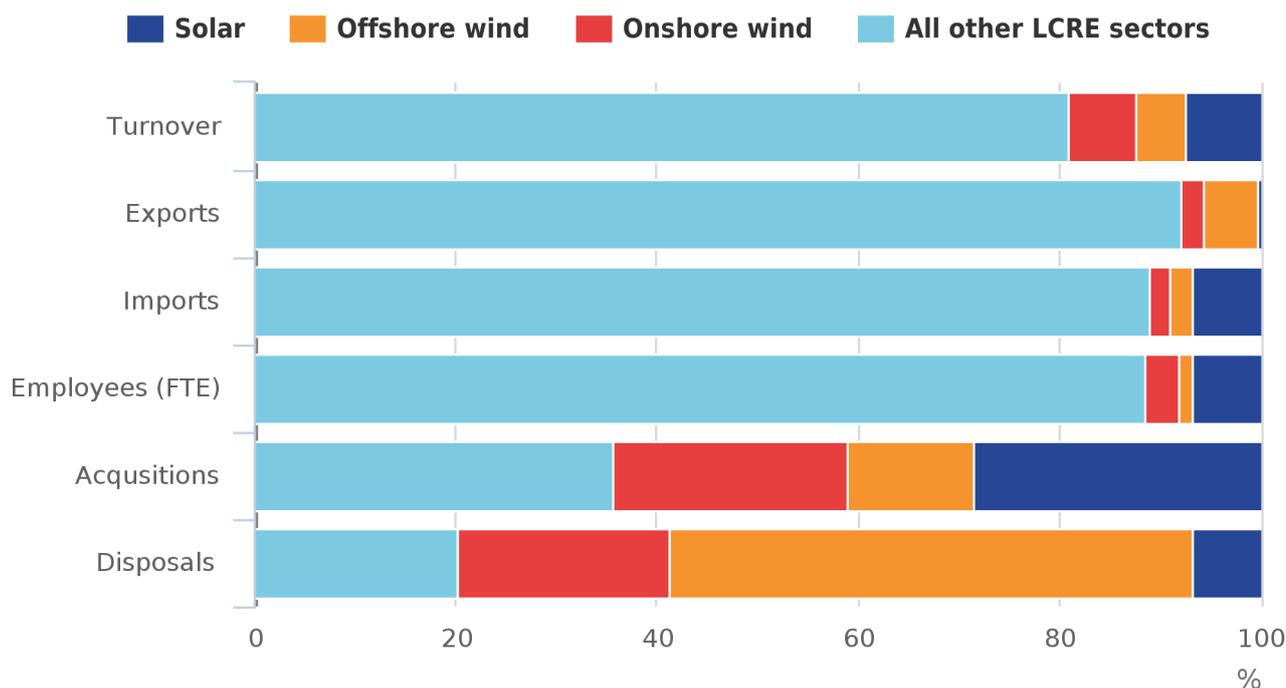
The manufacturing industry accounted for the highest proportion of energy efficient product employees (47.7%) closely followed by the construction industry (42.9%). The pattern was similar for turnover, with the manufacturing industry contributing 43.1% and the construction industry contributing 43.4%.

## 8 . How does the solar sector compare with the offshore and onshore wind sectors?

This section examines businesses that are involved in the production of electricity from solar and wind (both offshore and onshore) and the design, production, and/or installation of infrastructure for these purposes. This also includes operations and maintenance for these sectors.

**Figure 4: Contribution of the solar and wind sectors to the UK low carbon and renewable energy economy**

2015



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

We saw from Section 7 that the energy efficient products sector is relatively resource-intensive, accounting for a greater proportion of all 2015 low carbon and renewable energy (LCRE) employees (43.8%) than turnover (32.3%). In contrast, Figure 4 shows that in 2015, businesses active in the solar sector generated 7.3% of LCRE turnover (£3.2 billion) and employed 6.8% (16,000) of LCRE full-time equivalents (FTE). The offshore wind and onshore wind sectors accounted for 5.1% and 6.7% of LCRE economy turnover and employed 1.3% and 3.4% of LCRE FTE respectively. This lower proportion of employees than turnover compared with the energy efficient products sector can be explained by the fact that energy generation requires relatively few employees.

Electricity generation from solar panels is only included in the LCRE economy if turnover is generated from feed-in-tariffs. Houses or businesses that have solar panels that generate electricity for their own use are therefore out of scope of these estimates. Businesses that manufacture, design or install solar panels are included in the estimates regardless of whether the solar panels will be receiving feed-in-tariffs. This explains why the majority of employees (84.5%) and turnover (66.1%) generated in the solar sector are accounted for by businesses in the construction industry and not the electricity, gas, steam and air conditioning supply industry. This reflects the fact that the majority of activity in the solar sector is from businesses involved in the installation of solar panels, rather than from the generation of electricity from solar panels. Construction activities are more resource-intensive than the production of renewable energy, which may also explain why the solar sector accounts for a larger proportion of employment than the offshore and onshore wind sectors combined.

In contrast, the offshore and onshore wind sectors generate the largest proportion of their turnover from businesses in the electricity, gas, steam and air conditioning supply industry (47.4% and 54.7% respectively). This reflects that turnover in the wind sectors is predominantly from the generation of electricity rather than from other activities such as installation. As electricity generation requires relatively few employees, this explains why these two sectors account for a lower proportion of employees than turnover. This aligns with the fact that in [2015 more energy was generated by the onshore \(22,887 gigawatt hours \(GWh\)\) and offshore wind sectors \(17,423 GWh\) than in the solar sector \(7,561 GWh\)](#).

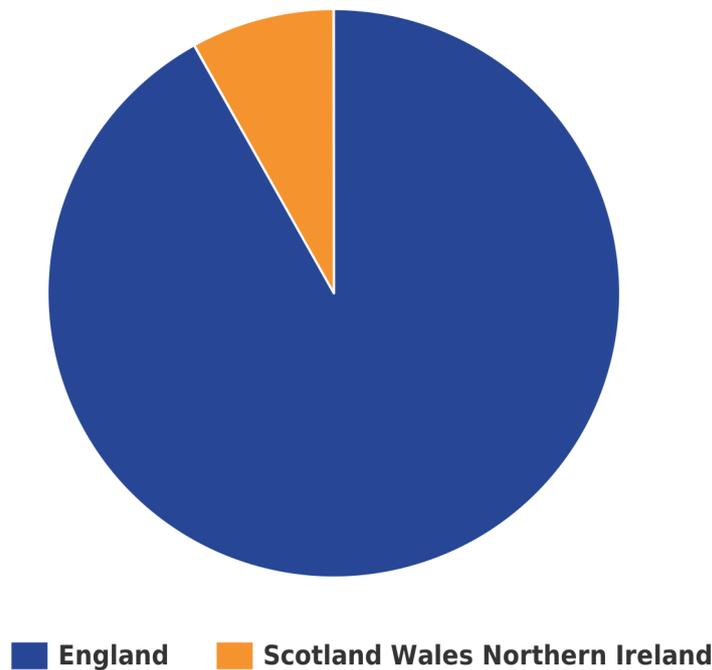
The solar sector was the largest sector in terms of LCRE acquisition of capital assets, accounting for 28.4% (£1.6 billion). This is mainly due to the acquisitions of new solar farms, which may not currently be generating high turnover but have relatively high start-up costs. The onshore wind sector accounted for the second largest proportion of capital acquisitions with £1.3 billion (23.4%). These estimates for acquisitions include solar panels and wind turbines but also include the cost of land that has been purchased for the construction of solar and wind farms.

The offshore wind sector accounted for just over half (51.9%) of LCRE disposals with £211 million. This industry saw the [sale of large one-off items such as wind farms and wind turbines in 2015](#). The onshore wind sector accounted for the second largest proportion of LCRE disposals with 21.2% (£86 million), while the solar sector accounted for just 6.8% (£27 million).

In 2015, of all offshore wind turnover 91.9% was generated in England (Figure 5); this would be expected as the [majority of offshore wind farms are on the coast of England](#). A larger proportion of offshore wind turnover was generated in Wales (5.3%) compared with Scotland and Northern Ireland combined (2.8%). This can be explained by the location of the offshore wind farms as well as activity by companies involved in the design, manufacture or installation of equipment related to offshore wind. In contrast, the majority of onshore wind turnover was generated in Scotland (52.9%). This aligns with the fact that [the majority of large capacity wind farms are in Scotland](#). There are a large number of small to medium sized onshore wind farms in Northern Ireland, which explains why this country accounts for a larger proportion of LCRE turnover (7.2%) than Wales (3.6%). The solar sector generated 94.3% of its turnover in England, this aligns with [the fact that the majority of feed-in-tariff solar panels are in England](#) and so companies involved in installation are also likely to be based in England.

**Figure 5.1: Offshore regional contributions to turnover from the solar and wind sectors**

2015



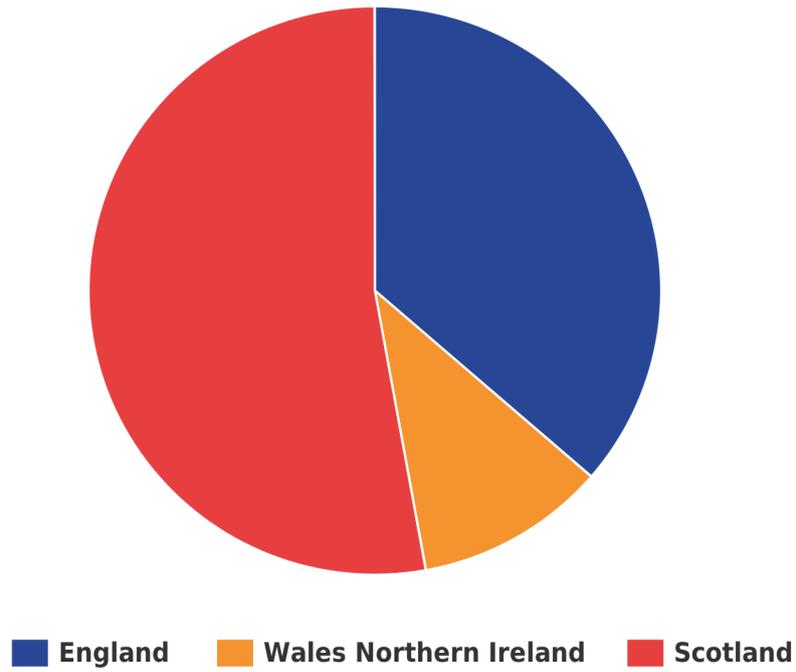
Source: Office for National Statistics, Low Carbon and Renewable Energy Economy Survey

Notes:

1. Scotland, Wales and Northern Ireland have been combined in this figures due to small estimates and disclosure control.

**Figure 5.2: Onshore regional contributions to turnover from the solar and wind sectors**

2015



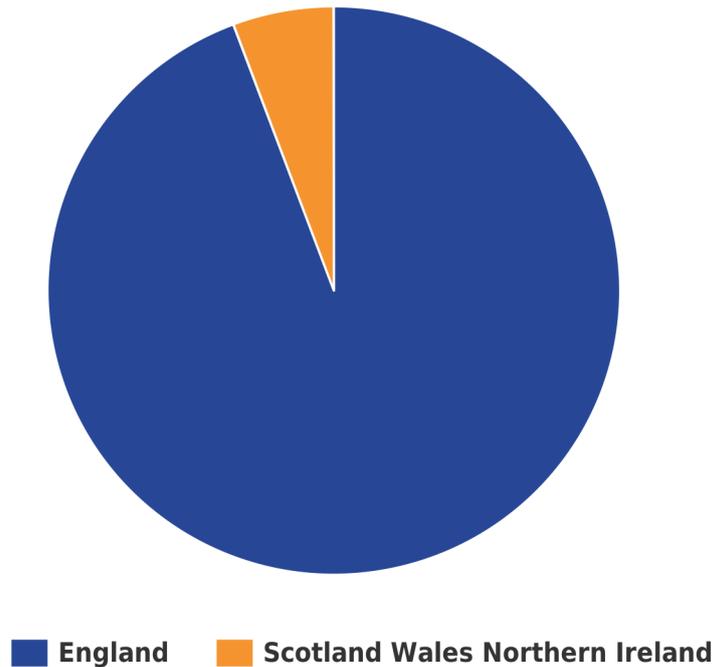
Source: Office for National Statistics, Low Carbon and Renewable Energy Economy Survey

**Notes:**

1. Scotland, Wales and Northern Ireland have been combined in this figures due to small estimates and disclosure control.

**Figure 5.3: Solar regional contributions to turnover from the solar and wind sectors**

2015



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

**Notes:**

1. Scotland, Wales and Northern Ireland have been combined in this figures due to small estimates and disclosure control.

## **9 . Estimates of indirect low carbon and renewable energy economy activity - Experimental**

### **Introduction**

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 [Code of Practice](#) 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 2014 and 2015 estimates should be interpreted with caution due to the precision of the survey-based estimates, see Section 10: Accuracy of the statistics for more information.

## 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 each UK country, based on the sector’s composition in terms of [Standard Industrial Classification](#) (SIC) and the corresponding multipliers for turnover and employment, which were published in February 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 the Quality and methodology section.

## The estimates

In the UK in 2015, an estimated £77.7 billion turnover was generated directly and indirectly by businesses active in the low carbon and renewable energy (LCRE) economy (Table 5), compared with £80.2 billion turnover in 2014. Of the total LCRE turnover generated in 2015, nearly half, 44.6% (£34.6 billion) was from indirect activities. LCRE businesses accounted for a total of 432,000 full-time equivalent (FTE) employees in 2015, of these, 45.9% (198,500) were from indirect activities (Table 6).

**Table 5. Estimates of direct and indirect turnover in the low carbon and renewable energy economy, UK and UK country, 2015**

	Turnover (£ millions)			
	Direct	Indirect	Total	% Indirect
UK	43,087	34,627	77,714	44.6
England	34,901	27,489	62,390	44.1
Scotland	5,506	5,014	10,520	47.7
Wales	1,727	1,342	3,068	43.7
Northern Ireland	954	783	1,737	45.1

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

Notes:

1. Figures may not sum due to rounding.
2. The methods used to calculate the indirect activity are experimental.

**Table 6. Estimates of direct and indirect employment in the low carbon and renewable energy economy, UK and UK country, 2015**

	Employment (FTE)			% Indirect
	Direct	Indirect	Total	
UK	234,000	198,500	432,000	45.9
England	187,000	155,000	342,000	45.3
Scotland	31,000	27,500	58,500	47.0
Wales	11,000	10,000	21,000	47.6
Northen Ireland	5,000	5,500	10,500	52.4

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

Notes:

1. Figures may not sum due to rounding.
2. The methods used to calculate the indirect activity are experimental.

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 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.

## 10 . Accuracy of the statistics: estimating and reporting uncertainty

The figures in this bulletin come from a survey of businesses. Surveys gather information from a sample rather than 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, not precise figures. This means that they are subject to a margin of error, which can have an impact on how changes in the estimates should be interpreted.

We can calculate the level of uncertainty (also called “sampling variability”) around a survey estimate by exploring how that estimate would change if we were to draw many survey samples for the same time period instead of just one. This allows us to define a range around the estimate (known as a “confidence interval”) and to state how likely it is in practice that the real value that the survey is trying to measure lies within that range. Confidence intervals are typically set up so that we can be 95% sure that the true value lies within the range – in which case we refer to a “95% confidence interval”. The confidence intervals for each estimate are presented in the [datasets](#).

The large confidence intervals are primarily a result of the reduction in sample size between 2014 and 2015; there is greater variability in the data that the 2015 estimates are based on, which reduces the confidence around them. It is not possible to directly assess whether or not the observed differences between the 2014 and 2015 estimates are likely to represent statistically significant change.

The sample for the LCRE survey is stratified by Standard Industrial Classification (SIC) (see QMI). Analysis of 2014 and 2015 data has found businesses within the same SIC to be active in a range of low carbon and renewable energy sectors – there is not a direct mapping of low carbon and renewable energy sector to SIC. This, in combination with the reduction in sample size, makes estimating business counts difficult. The estimates of business counts should therefore be treated with caution. A business is counted as active in the low carbon and renewable energy sector if it has any activity within in. This should be taken into account when using the data.

# 11 . Quality and methodology

The [Low Carbon and Renewable Energy Economy Survey Quality and Methodology Information document](#) contains important information on:

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

## The 2015 Low Carbon and Renewable Energy Survey

The Low Carbon and Renewable Energy (LCRE) Economy Survey was despatched for the second time, in 2016 for the reporting year 2015, to a sample of 13,913 businesses. It achieved a response rate of 84.0% and of those responding, 1,597 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 ([QMI](#)).

The survey sample size was reduced from around 40,000 in 2014 to around 14,000 in 2015. In order to enhance the sample for 2015, a number of businesses that were known to have activity in the low carbon and renewable energy (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

The method used to calculate business counts for sectors within the low carbon and renewable energy economy has changed since the publication of the 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 a 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. The methodology now used 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 new methodology has been applied to both 2014 and 2015 figures released alongside this bulletin. The method used to calculate the UK total number of businesses within the low carbon and renewable energy economy is unchanged.

## 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, 2015 provisional results](#) (released on 10 November 2016). The Annual Business Survey 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 and 01.5 mixed farming, which were included in the Low Carbon and Renewable Energy Economy Survey. These industries are included in the low carbon survey results. This should be considered when making comparisons. At the time of writing, regional ABS results for 2015 were not available. Therefore, 2014 ABS regional data have been used to derive proportions, which have then been applied to the UK 2015 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 low carbon survey. However, figures for Northern Ireland derived from the QES do include employees in industries 63 information service activities, and 95 repair of computers and personal and household goods. This should be considered when making comparisons.

Total UK non-financial business economy imports and exports are derived from [UK Balance of Payments, The Pink Book 2016](#). To ensure a like-for-like comparison, data by industry are required to remove industries that are not selected for the Low Carbon and Renewable Energy Economy Survey. UK imports and exports figures are not available by industry and therefore an exact comparison is not possible. However, figures are available for financial imports and exports. As financial industries are excluded from the Low Carbon and Renewable Energy Economy Survey sample, these have been excluded from the calculation, which will improve comparability.