

Statistical bulletin

UK Environmental Accounts: Low Carbon and Renewable Energy Economy Survey: 2014 final estimates

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

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Table of contents

1. [Main points](#)
2. [Introduction](#)
3. [UK estimates](#)
4. [Estimates by UK country](#)
5. [Activity by sector of industry](#)
6. [Activity by low carbon and renewable energy group in the UK](#)
7. [Activity by low carbon and renewable energy group in the UK countries](#)
8. [Activity by the renewable energy group](#)
9. [Detailed group analysis](#)

1 . Main points

In 2014, around 96,500 businesses in the UK operated in the low carbon and renewable energy (LCRE) economy, equivalent to 4.4% of all non-financial businesses. This activity generated £46.2 billion turnover and employed 238,500 full-time equivalent (FTE) workers.

In Scotland, 5.2% of non-financial businesses operated in the LCRE economy in 2014. LCRE activities generated £5.6 billion turnover and employed 21,500 FTE employees in Scotland.

The majority of businesses undertaking LCRE activity in the UK operated in the construction industry. This activity generated £12.4 billion LCRE turnover and employed 96,500 FTE employees.

LCRE activity associated with renewable energy generated £15.9 billion turnover and employed 43,500 FTE employees in the UK in 2014.

The energy efficient products group generated 47.3% (£21.9 billion) of LCRE turnover and employed 65.2% (155,500) of LCRE FTE employees.

The low emissions vehicle group dominated LCRE exports, accounting for 60.4% of total LCRE exports, equivalent to £2.9 billion.

2 . Introduction

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 UK¹. The survey was sent for the first time in 2015 (for the reporting year 2014) to a sample of 41,483 UK businesses. It achieved a response rate of 84.5% and of those who responded, 3,366 businesses were operating in the LCRE sectors covered by the survey. The [first estimates](#) were published in December 2015.

Results from the survey can be used to show business activity in 6 low carbon groups². These groups can be subdivided into 17 low carbon sectors³. A series of sector-specific articles were published in March and April 2016 covering the [solar](#), [nuclear](#) and [onshore wind](#) sectors. Following completion of extensive quality assurance, this final estimates bulletin updates all previously published estimates. Previously unpublished sector-specific data are also presented here, in addition to industry-level data.

This bulletin presents direct⁴ LCRE activity estimates:

- for the UK overall and UK countries
- by industry
- by LCRE group for the UK overall and UK countries
- at a sector and industry level, for each of the LCRE groups (subject to disclosure control).

Notes for Introduction:

1. Further information on survey methods can be found in the [Methodology Annex](#).
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 low emission vehicles and infrastructure and fuel cells and energy storage sectors).
3. The low carbon sectors are: offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, 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.
4. Estimates of indirect LCRE activity using published multipliers will be published later this year.

3 . UK estimates

In 2014, around 96,500 businesses, equivalent to 4.4% of all UK non-financial businesses¹, were directly engaged in low carbon and renewable energy (LCRE) activity. Total turnover of £46.2 billion was generated from these activities, accounting for 1.3% of total UK non-financial turnover in 2014. LCRE activities resulted in employment of 238,500 full-time equivalent (FTE) employees², accounting for 1.3% of UK FTE employees in the non-financial business economy (Table 1).

Table 1: Low carbon and renewable energy economy activity ⁽¹⁾, 2014

UK

	Low carbon and renewable energy economy	Percentage of total non-financial business economy activity
Number of businesses ²	96,500	4.4
Turnover (£ thousands) ³	46,193,500	1.3
Employees (full-time equivalents) ⁴	238,500	1.3
Imports (£ thousands) ⁵	5,890,000	1.1
Exports (£ thousands) ⁵	4,755,000	1.0
Acquisitions (£ thousands) ³	8,731,500	4.8
Disposals (£ thousands) ³	511,000	1.5

Source: Office for National Statistics

1. Figures may not sum due to rounding.

2. Total number of businesses in the UK non-financial business economy derived from UK Business: Activity, Size and Location 2015. This is based on an extract taken from the ONS Inter-departmental Business Register in March 2015. Low Carbon Survey results are based on the calendar year 2014; this should be considered when making comparisons.

3. Total turnover and acquisitions and disposals of capital assets in the UK are derived from the ONS Annual Business Survey (ABS), UK non-financial business economy, 2014 Provisional Results (released 12th November 2015). To ensure a like-for-like comparison, data by industry are required to remove those industries that are not selected for the Low Carbon and Renewable Energy Economy Survey. The ABS excludes the following agricultural industries that are included in the Low Carbon Survey: 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. This should be considered when making comparisons.

4. Total FTE employees in the UK non-financial business economy are derived from the Business Register and 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. Figures for Northern Ireland however, derived from QES do include employees in industries 63 Information service activities and industries 95 Repair of computers and personal and household goods. This should be considered when making comparisons. It should be noted that BRES data are collected at local unit (site) level where ABS data are collected at a reporting unit (business) level. This should be considered when making comparisons.

5. Total UK non-financial business economy imports and exports are derived from UK Balance of Payments, The Pink Book, 2015. To ensure a like-for-like comparison, data by industry are required to remove those 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 calculations, which will improve comparability.

LCRE activities in 2014 resulted in £5.9 billion in imports (1.1% of total UK non-financial imports) and £4.8 billion in exports (1.0% of total UK non-financial exports). In terms of capital assets ³, LCRE activity resulted in £8.7 billion in acquisitions (4.8% of total UK non-financial acquisitions) and £500 million in proceeds from disposals (1.5% of total UK non-financial disposals).

Over 4% of UK non-financial businesses were found to be active in the LCRE economy in 2014. For many of these businesses, the low carbon activity was not their main activity. For example, farming businesses may utilise land to generate income from solar panels or wind turbines. Manufacturing companies may utilise excess biomass to generate income from fuel. They may however, only have 1 person spending 20% of their time working on these activities and so would be counted as 0.2 FTE employees. Partly due to this, employment per business is small. Specifically, of the 96,500 businesses operating in the LCRE economy, the low carbon activity was the primary activity of 34.1% of these businesses⁴. These businesses generated 57.0% of LCRE turnover, and employed 75.1% of LCRE employees.

Notes for UK Estimates

1. For more information on what constitutes the non-financial business economy see the [Methodology Annex](#).
2. One FTE employee may be thought of as one person year. For example, a person who normally spends 30% of their time in one sector and the rest in other sectors should be considered as 0.3 FTE employee.
3. 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.
4. Low carbon and renewable energy activity is classed as the primary activity of a business if 50% or more of its FTE employees are working on the low carbon and renewable energy sectors.

4 . Estimates by UK country

Scotland had the greatest percentage of businesses engaged in low carbon and renewable energy (LCRE) activities in 2014, with the equivalent of 5.2% of all non-financial businesses in Scotland reporting some activity in the LCRE sectors (Table 2). This accounted for 8.3% of all businesses working in the LCRE economy in the UK. The greatest proportion of LCRE turnover was also estimated for Scotland, accounting for 2.4% (£5.6 billion) of all turnover generated in the Scottish non-financial business economy. LCRE turnover in Scotland accounted for 12.2% of all LCRE turnover generated in the UK. A total of 21,500 full-time equivalent (FTE) employees were employed in LCRE sectors in Scotland, accounting for 1.5% of all FTE non-financial employees in the country.

In England, 83,000 businesses (equivalent to 4.4% of all non-financial businesses in England) were active in the LCRE sectors in 2014. Businesses active in LCRE sectors in England accounted for 86.0% of UK LCRE businesses. Turnover of £37.6 billion was generated, accounting for 1.2% of all non-financial turnover generated in England. An estimated 201,000 FTEs were employed, representing 1.3% of all non-financial FTE employees in England.

In 2014, around 3,500 businesses in Wales (equivalent to 3.9% of all non-financial businesses in Wales) were engaged in LCRE activity, accounting for 1.9% (£2.0 billion) of total non-financial turnover generated in the country. A total of 9,500 FTEs were employed in LCRE sectors accounting for 1.3% of all FTE non-financial employees in Wales.

In Northern Ireland, 2,000 businesses (equivalent to 3.2% of all non-financial businesses in Northern Ireland) were estimated to be LCRE active, generating 1.6% (£1.0 billion) of total non-financial turnover in the country. A total of 6,500 FTEs were employed in LCRE sectors, accounting for 1.5% of all FTE non-financial employees.

Activity in England accounted for 80.8% (£7.1 billion) of LCRE acquisitions of capital assets. Scotland accounted for 14.3% (£1.3 billion) of LCRE acquisitions of capital assets.

Of the £5.9 billion in LCRE imports in 2014, around 84.9% (£5.0 billion) was from activity in England and 6.7% (£0.4 billion) from LCRE imports activity in Scotland. In terms of the £4.8 billion in LCRE exports, 84.6% (£4.0 billion) was from activity in England¹.

Table 2: Low carbon and renewable energy economy activity ⁽¹⁾, 2014

UK and UK country

	Low carbon and renewable energy economy	Percentage of UK LCRE total	Percentage of total non-financial business economy activity
Number of businesses²			
England	83,000	86.0	4.4
Scotland	8,000	8.3	5.2
Wales	3,500	3.6	3.9
Northern Ireland	2,000	2.1	3.2
UK	96,500		
Turnover (£ thousands)³			
England	37,558,500	81.3	1.2
Scotland	5,613,500	12.2	2.4
Wales	1,977,500	4.3	1.9
Northern Ireland	1,044,000	2.3	1.6
UK	46,193,500		
Employees (full-time equivalents)⁴ Percentage of total non-financial business economy activity based on 2013 ABS			
England	201,000	84.3	1.3
Scotland	21,500	9.0	1.5
Wales	9,500	4.0	1.3
Northern Ireland	6,500	2.7	1.5
UK	238,500		
Acquisitions (£ thousands)³			
England	7,052,000	80.8	..
Scotland	1,251,000	14.3	..
Wales	278,500	3.2	..
Northern Ireland	150,000	1.7	..
UK	8,731,500		

Source: Office for National Statistics

1. Figures may not sum due to rounding. The dataset accompanying this bulletin contains estimates for imports and exports for UK countries where available.

2. Total number of businesses in the UK non-financial business economy are derived from UK Business: Activity, Size and Location 2015. This is based on an extract taken from the ONS Inter-departmental Business Register in March 2015. Low Carbon Survey results are based on the calendar year 2014, this should be considered when making comparisons.

3. Total turnover and acquisitions of capital assets in the UK non-financial business economy are derived from ONS Annual Business Survey (ABS), UK Non-Financial Business Economy, 2014 Provisional Results. The 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 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 results for 2014 were not available. Therefore, 2013 ABS data have been used to derive proportions which have then been applied to the UK 2014 total. Regional breakdown of acquisitions of capital assets are not available.

4. Regional full-time equivalent non-financial business economy estimates are derived from the ONS Business Register and 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. Figures for Northern Ireland however, derived from QES, do include employees in industries 63 Information service activities and industries 95 Repair of computers and personal and household goods. This should be considered when making comparisons.

Notes for Estimates by UK Country

1. Further regional breakdown are not available due to disclosure control. Further data can be found in the [Estimates dataset](#) (subject to disclosure control) and accompanying Coefficients of Variation (CV) are presented in the [CV dataset](#)

5 . Activity by sector of industry

This section presents low carbon and renewable energy (LCRE) estimates by industry using the UK Standard Industrial Classification (SIC). While SIC is a description of the main activity of the industry it may not fully match the description of the underlying LCRE business.

The majority of businesses undertaking LCRE activity¹ in the UK in 2014 were operating in the construction industry (52.8%) (Figure 1). Businesses operating in this industry generated 26.9% (£12.4 billion) of LCRE turnover and employed 40.5% (96,500) of full-time equivalent (FTE) employees. The construction industry accounted for 6.9% (£0.4 billion) of LCRE imports² and 5.5% (£0.5 billion) of LCRE acquisitions of capital assets.

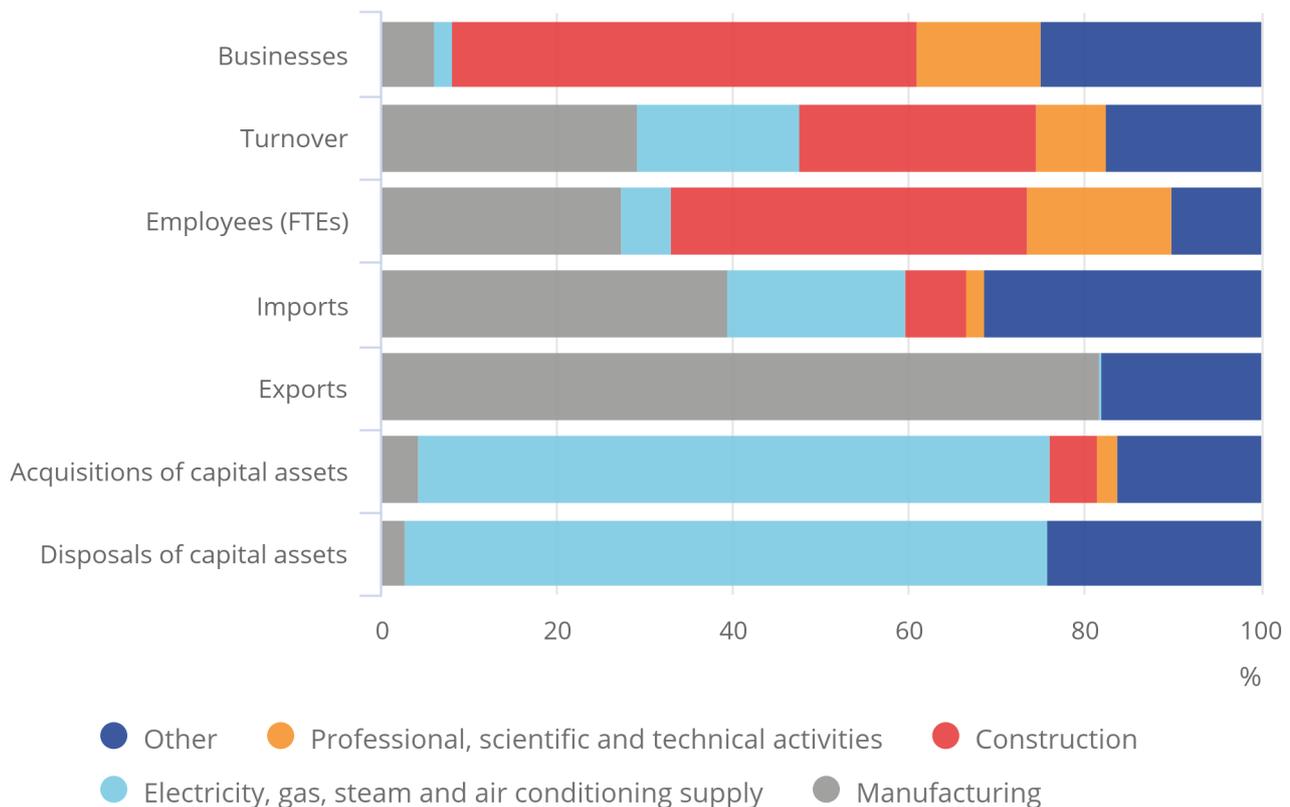
The greatest proportion of LCRE turnover (29.2%) in 2014 was generated in the manufacturing industry, equivalent to £13.5 billion. Businesses in this industry however, only accounted for 6.2% (6,000) of LCRE businesses. The manufacturing industry employed 27.5% (65,500) of LCRE FTE employees. The majority (81.8%) of LCRE exports were in the manufacturing industry, with exports of £3.9 billion. In contrast, imports in this industry accounted for 39.6% (£2.3 billion) of LCRE imports.

Figure 1: Low carbon and renewable energy activity: by selected industry, 2014

UK

Figure 1: Low carbon and renewable energy activity: by selected industry, 2014

UK



Source: Office for National Statistics

Notes:

1. "Other" includes the following industries: agriculture, forestry and fishing, mining and quarrying, water supply; sewerage, waste management and remediation activities, wholesale and retail trade; repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities, information and communication, real estate activities, administrative and support service activities, public administration and defence; compulsory social security, education and other activities.

A small number of businesses (2,000) in the electricity, gas, steam and air conditioning supply industry carried out LCRE activity in 2014; however, these businesses generated 18.5% (£8.6 billion) of LCRE turnover. They also employed 5.7% (13,500) of LCRE FTE employees. LCRE exports in this industry were small³, but these businesses accounted for 20.2% (£1.2 billion) of LCRE imports. The vast majority of acquisitions and disposals of LCRE capital assets however, were in this industry, accounting for 71.8% (£6.3 billion) of LCRE capital asset acquisitions and 73.1% (£0.4 billion) of LCRE capital asset disposals.

The professional, scientific, and technical activities industry accounted for 14.0% (13,500) of LCRE businesses and generated 7.9% (£3.6 billion) of LCRE turnover in 2014. This industry employed 16.4% (39,000) of LCRE FTE employees. This industry includes design and consulting services and shows that the scope of the LCRE economy is not just limited to production of electricity and manufacturing equipment for this purpose. These services are quite labour intensive but do not require a significant amount of capital acquisitions which were negligible.

Notes for Industrial Activity

1. UK LCRE activity estimates are presented by [Standard Industrial Classification \(SIC\) 2007](#). Further data can be found in the [Estimates dataset](#) (subject to disclosure control) and accompanying Coefficients of Variation (CVs) are presented in the [CV dataset](#).
2. Construction industry LCRE exports have been suppressed for disclosure control and are included in the “Other” category.
3. Note the export of electricity is not in scope.

6 . Activity by low carbon and renewable energy group in the UK

This section looks at low carbon and renewable energy (LCRE) activity in 2014 by LCRE group (subject to disclosure control). Results from the survey can be used to show business activity in 6 low carbon groups, namely: low carbon electricity, low carbon heat, energy from waste and biomass, energy efficient products, low carbon services and low carbon emission vehicles¹.

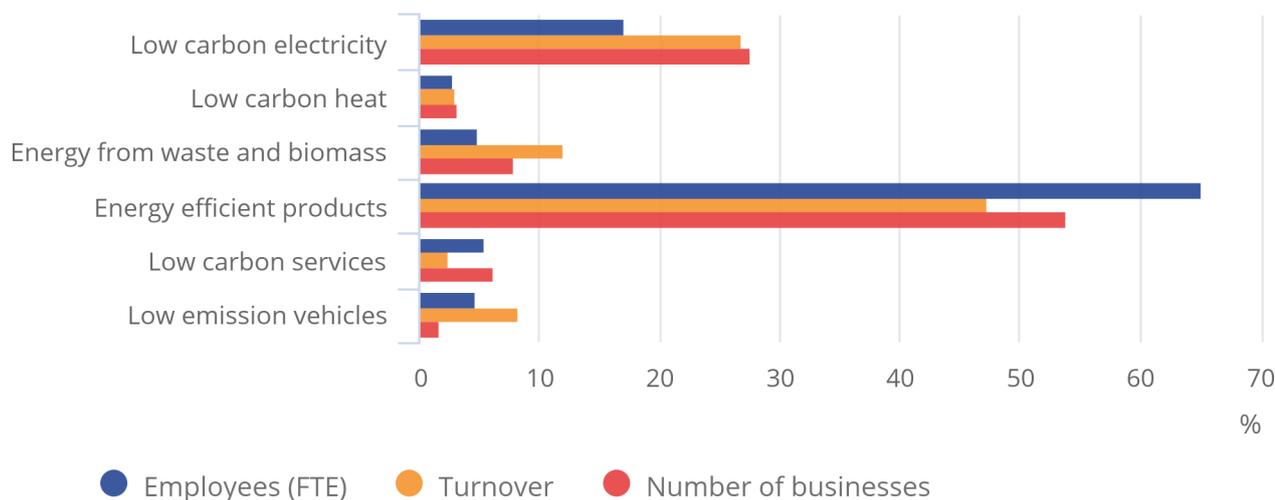
The energy efficient products group was the largest LCRE group in 2014 in terms of number of businesses, turnover and employees (Figure 2). This group employed 65.2% (155,500) of LCRE full-time equivalent (FTE) employees and generated 47.3% (£21.9 billion) of LCRE turnover. Compared with other LCRE groups, such as primary electricity, businesses operating in the energy efficient products group are fairly labour intensive. Many businesses in this group focus on installing and manufacturing products.

Figure 2: Low carbon and renewable energy businesses, turnover and employees: by group, 2014

UK

Figure 2: Low carbon and renewable energy businesses, turnover and employees: by group, 2014

UK



Source: Office for National Statistics

Notes:

1. The estimates for waste and biomass should be treated with caution due to high coefficients of variation (CV). CVs can be used as a guide to the accuracy of the estimate. The lower the CV the greater the accuracy of the estimate. The ranges used for the purpose of this bulletin are very good, good, acceptable and treat with caution.
2. Low emission vehicles include low emission vehicles and infrastructure, and fuel cells and energy storage.

The low carbon electricity group was the second largest LCRE group in 2014 in respect of the number of businesses, turnover generated and employees. However, while businesses operating in this group generated 26.9% of LCRE turnover (£12.4 billion), they employed only 17% (40,500) of LCRE FTE employees. This reflects that many businesses operating in this group were generating electricity, which requires fewer employees than activities in some of the other groups, such as installation.

LCRE businesses exports were worth £4.8 billion in 2014. Exports in the low emission vehicles group accounted for 60.4% of total LCRE exports, equivalent to £2.9 billion (Figure 3). This group was one of the smallest in terms of number of businesses and turnover, representing 1.6% (1,500) of LCRE businesses in the UK and generating 8.2% (£3.8 billion) of LCRE turnover.

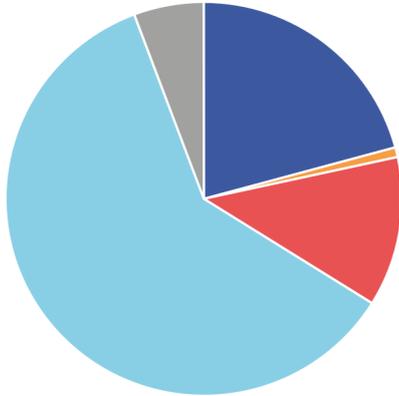
The low carbon electricity group accounted for 20.8% of LCRE exports, equivalent to £988 million. The export of electricity is excluded from the exports figures and therefore this consists of products used for generating electricity, such as wind turbines and solar panels.

Figure 3: Low carbon and renewable energy exports: by group, 2014

UK, percentages

Figure 3: Low carbon and renewable energy exports: by group, 2014

UK, percentages



Source: Office for National Statistics

Notes:

1. "Other" includes energy from waste and biomass and low carbon services groups.

LCRE businesses imports were worth £5.9 billion in 2014. The energy efficient products group contributed 26.5% of the total value of LCRE imports, equivalent to £1.6 billion (Figure 4). This is due to businesses in this sector importing equipment to install and parts for the manufacture of energy efficient lighting and products.

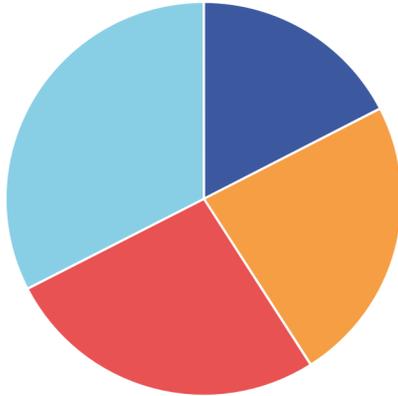
Imports in the energy from waste and biomass group accounted for 23.5% of total LCRE imports in the UK, equivalent to £1.4 billion. As production of electricity is excluded from the imports definition, this group will include specialist equipment and fuel that is used in the process of electricity generation. This is also true for the low carbon electricity group, which accounted for 17.4% (£1.0 billion) of total LCRE imports.

Figure 4: Low carbon and renewable energy imports: by group, 2014

UK, percentages

Figure 4: Low carbon and renewable energy imports: by group, 2014

UK, percentages



Source: Office for National Statistics

Notes:

1. "Other" includes low carbon heat, low carbon services and low emission vehicles groups.
2. Figures may not sum due to rounding.

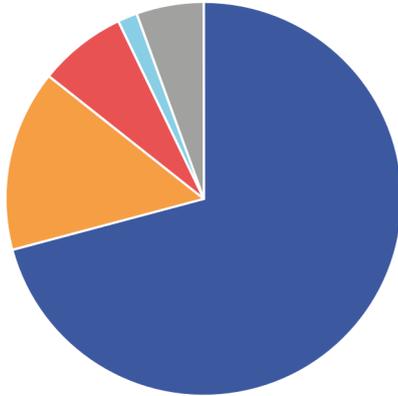
LCRE businesses spent £8.7 billion on LCRE acquisitions of capital assets in 2014. The low carbon electricity group accounted for 70.9% of LCRE acquisitions of capital assets in 2014, equivalent to £6.2 billion (Figure 5). These are likely to have been one-off large purchases such as wind turbines or solar panels. Similarly, acquisitions of capital assets were relatively high in the energy from waste and biomass group, with £1.3 billion spent in 2014 (14.9%). Acquisition of capital assets in this group will also have been large purchases of equipment for electricity generation. However, the energy efficient products group which had the largest number of LCRE businesses and turnover in the UK, accounted for just 7.2% (£626 million) of LCRE acquisitions of capital assets. Inputs into production in this group were generally less capital intensive compared with other LCRE groups.

Figure 5: Low carbon and renewable energy acquisitions of capital assets: by group, 2014

UK, percentages

Figure 5: Low carbon and renewable energy acquisitions of capital assets: by group, 2014

UK, percentages



Source: Office for National Statistics

Notes:

1. The estimates for low emission vehicles should be treated with caution due to high coefficients of variation.
2. "Other" includes low carbon heat and low carbon services.
3. Figures may not sum due to rounding.

Notes for Group Activity in the UK

1. The 17 sectors reported in the Low Carbon and Renewable Energy Economy Survey are: offshore wind; onshore wind; solar photovoltaic; hydropower; other renewable electricity; 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.

7 . Activity by low carbon and renewable energy group in the UK countries

This section presents low carbon and renewable energy (LCRE) group activity by UK country. These estimates show the country where the low carbon activity took place rather than where the head office of the business was located.

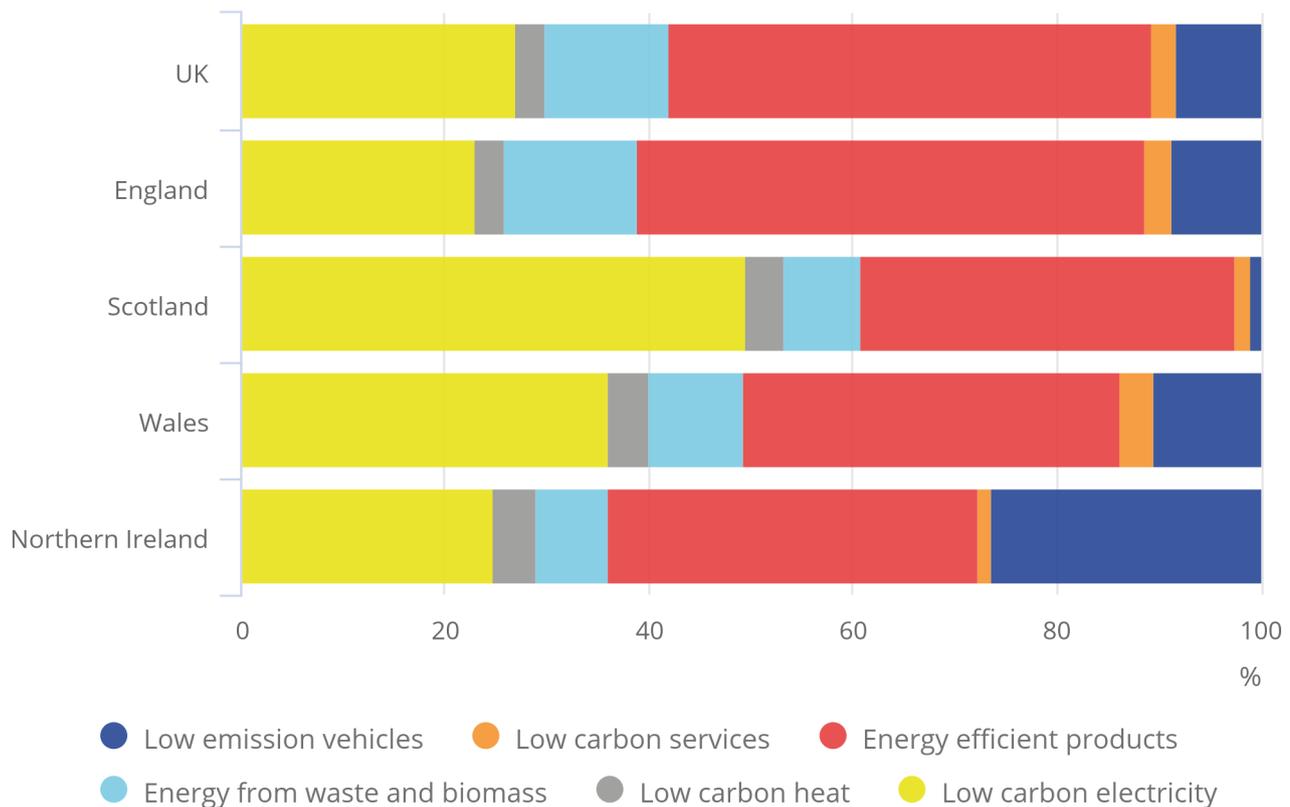
LCRE activity in the UK generated £46.2 billion turnover in 2014 and 47.3% (£21.9 billion) of this was in the energy efficient products group (Figure 6). The greatest percentage of LCRE turnover was generated in this group in all the UK countries except Scotland. Energy efficient products turnover made up 49.8% (£18.7 billion) of LCRE turnover in England, 37.0% (£732 million) in Wales, 36.8% (£2.1 billion) in Scotland and 36.2% (£378 million) in Northern Ireland. In Scotland, the greatest percentage of LCRE turnover (49.6%) was generated in the low carbon electricity group equivalent to £2.8 billion.

Figure 6: Turnover: by low carbon and renewable energy group, 2014

UK and UK country

Figure 6: Turnover: by low carbon and renewable energy group, 2014

UK and UK country



Source: Office for National Statistics

Notes:

1. The estimates for low carbon services (England, Wales and Northern Ireland), low carbon heat (Scotland) and waste and biomass (Scotland and Wales) should be treated with caution due to high coefficients of variation.

Among the UK countries, England generated a greater percentage of UK LCRE turnover in all of the groups in 2014, with over 80% turnover in every group except for low carbon electricity and low carbon heat. Of the turnover generated in the low carbon electricity group, 69.8% (£8.7 billion) was generated in England and 22.4% (£2.8 billion) was generated in Scotland (Table 3). This is consistent with Scotland having generated the largest proportion of its LCRE turnover from the low carbon electricity group (figure 6). Similarly, in the low carbon heat group, compared with other groups, turnover was relatively high in Scotland¹ and Wales, with 15.0% of turnover generated in Scotland and 5.8% generated in Wales.

Table 3: Low carbon and renewable energy turnover, 2014

UK country

	%			
	England	Scotland	Wales	Northern Ireland
Low carbon electricity	69.8	22.4	5.7	2.1
Low carbon heat	76.0	15.0	5.8	3.2
Energy from waste and biomass	87.8	7.6	3.3	1.4
Energy efficient products	85.5	9.4	3.3	1.7
Low carbon services	86.2	7.1	5.5	1.1
Low emission vehicles and infrastructure and fuels cells and energy storage	85.8	1.4	5.5	7.3

Source: Office for National Statistics

1. Figures may not sum due to rounding.

2. The estimates for low carbon services (England and Wales), low carbon heat (Scotland) and waste and biomass (Scotland and Wales) should be treated with caution due to high coefficients of variation. Further data can be found in the estimates dataset (subject to disclosure control).

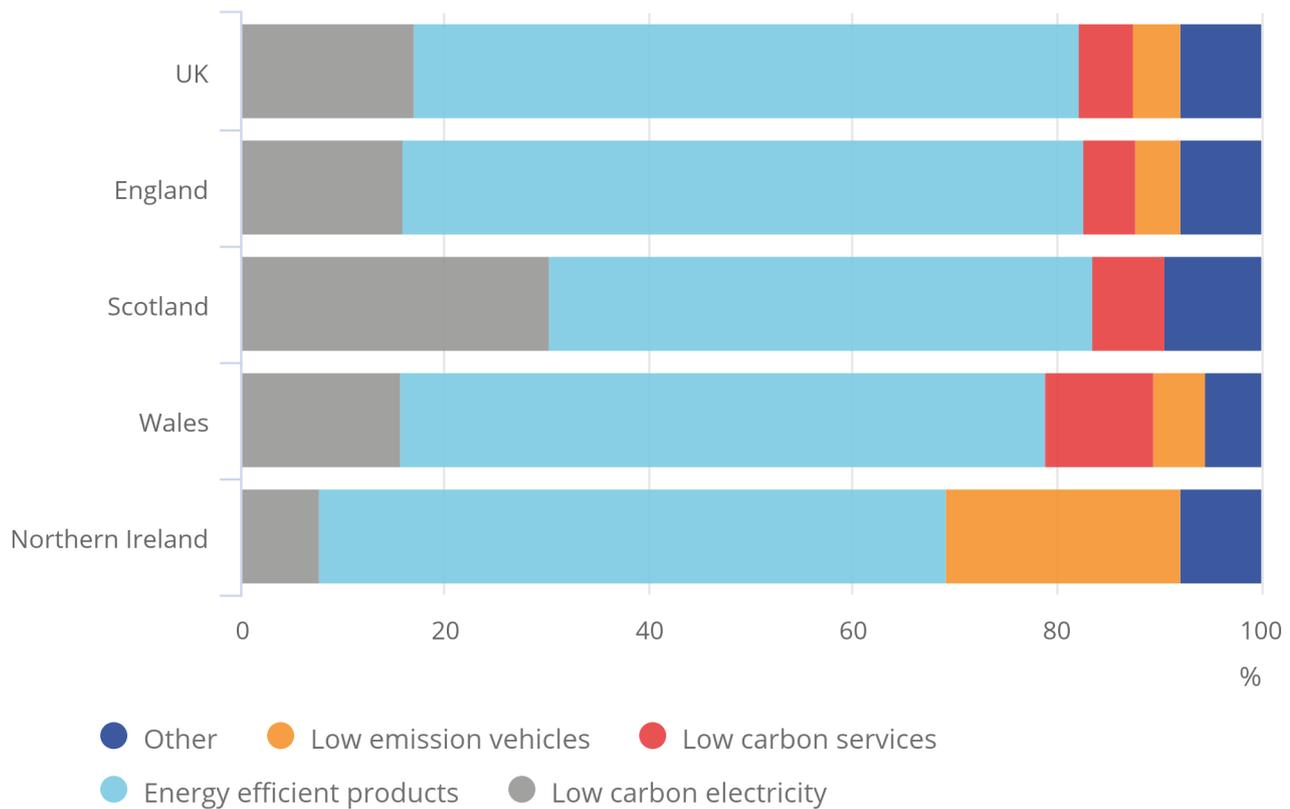
Businesses operating in the energy efficient products group employed 65.2% of full-time equivalent (FTE) employees in the UK in 2014. Businesses operating in the low carbon electricity group employed 17.0% FTE employees (Figure 7). The low carbon electricity group was the largest LCRE group in terms of number of businesses and turnover in Scotland. However, in respect of employees, this group accounted for just 30.2% of LCRE FTE employees, with the energy efficient products group accounting for 53.5% of FTE employees. The smaller employment estimated for the low carbon electricity group is consistent across the UK. This is due to installation activity in the energy efficient products group requiring a greater number of workers than the low carbon electricity group, which includes electricity generation.

Figure 7: Employees (full-time equivalents): by low carbon and renewable energy group, 2014

UK and UK country

Figure 7: Employees (full-time equivalents): by low carbon and renewable energy group, 2014

UK and UK country



Source: Office for National Statistics

Notes:

- "Other" includes low carbon heat and energy from waste and biomass. The estimates for low carbon services (England and Wales) should be treated with caution due to high coefficients of variation. Due to disclosure control some groups are not shown for some countries.

In Northern Ireland, 23.1% of LCRE employees were working in the low emission vehicles group in 2014. Many of these employees were involved in the manufacture of parts for low emission vehicles. Table 4 shows that the majority of employees in this group were working in England (81.8%) with 13.6% of employees in this group working in Northern Ireland. This was the same pattern among all the LCRE groups, with around 80% or more of employees working in England.

Table 4: Low carbon and renewable energy employees (full-time equivalents), 2014

UK country	%			
	England	Scotland	Wales	Northern Ireland
Low carbon electricity	79.0	16.0	3.7	1.2
Low carbon heat	84.6	15.4
Energy from waste and biomass	83.3	12.5	4.2	0.0
Energy efficient products	86.5	7.4	3.9	2.6
Low carbon services	80.0	12.0	8.0	0.0
Low emission vehicles and infrastructure and fuels cells and energy storage	81.8	0.0	4.5	13.6

Source: Office for National Statistics

1. Figures may not sum due to rounding.

2. The estimates for low carbon services (England and Wales), low carbon heat (Scotland and Wales) and waste and biomass (Wales) should be treated with caution due to high coefficients of variation. Due to disclosure control some estimates are not shown. Further data can be found in the Estimates data table (subject to disclosure control).

Notes for Group Activity by UK Country

1. The estimates for low carbon heat group in Scotland should be treated with caution due to high coefficients of variation.

8 . Activity by the renewable energy group

This section looks at a range of low carbon and renewable energy (LCRE) sectors that have been grouped together to represent renewable energy activities. The sectors in this renewable group include: offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, renewable heat, renewable combined heat and power, bioenergy and alternative fuels.

In 2014, around 35,000 LCRE businesses were operating in the renewable energy group in the UK. Over 8 in 10 (82.9%) of these businesses were in England (29,000) and 12.9% were in Scotland (4,500) (Table 5). In Wales and Northern Ireland, the proportion of businesses operating within the renewable energy group was 4.3% and 1.4% respectively.

Table 5: Renewable energy group businesses, turnover and employees, 2014

UK and UK country

	Number of businesses	Turnover (£ thousands)	Employees (full-time equivalents)
UK	35,000	15,874,000	43,500
England	29,000	11,798,000	33,500
Scotland	4,500	2,742,500	6,500
Wales	1,500	958,000	2,000
Northern Ireland	500	375,500	1,000

Source: Office for National Statistics

1. Renewable energy group includes offshore wind, onshore wind, solar photovoltaic, hydropower, other renewable electricity, renewable heat, renewable combined heat and power, bioenergy and alternative fuels.

2. Figures may not sum due to rounding.

The LCRE sectors included in the renewable energy group generated £15.9 billion turnover in the UK in 2014. Nearly three-quarters (74.3%) of this turnover was generated in England, equivalent to £11.8 billion, while Scotland generated 17.3% of turnover equivalent to £2.7 billion.

LCRE businesses included in the renewable energy group employed around 43,500 full-time equivalent (FTE) employees in the UK in 2014. Over 7 in 10 (77.0%) of them were employed in England (33,500), while 14.9% (6,500) were employed in Scotland. In Wales and Northern Ireland, the proportion of FTEs employed in the renewable energy group was 4.6% and 2.3% respectively.

9 . Detailed group analysis

This section presents detailed estimates by low carbon and renewable energy (LCRE) group activity by UK country, including sector and industry estimates (subject to disclosure control)¹.

Low carbon electricity group

Table 6: Low carbon electricity group activity, 2014

UK	
Number of businesses	26,500
Turnover (£ thousands)	12,434,000
Employees (full-time equivalents)	40,500
Exports (£ thousands)	987,500
Imports (£ thousands)	1,025,500
Acquisitions (£ thousands)	6,188,500
Disposals (£ thousands)	428,500

Source: Office for National Statistics

The low carbon electricity group includes: onshore wind, offshore wind, solar photovoltaic, hydropower, other renewable electricity, carbon capture & storage and nuclear sectors. Overall, this group generated around £12.4 billion turnover and employed 40,500 full-time equivalent (FTE) employees in 2014 (Table 6). Over 26,000 businesses were active in this group.

Within the low carbon electricity group, 71.7% (19,000) of businesses were operating in the solar photovoltaic sector in 2014. These businesses were working in the solar sector in a primary or secondary capacity. The main activity of many of these businesses fell outside of the LCRE economy; however, turnover was generated through the production of electricity from solar panels. For example, farming businesses may utilise land to generate income from solar panels. To be included in the estimate, a business had to be receiving at least £1,000 (rounded) in turnover or feed-in tariff (FIT) payments from solar sector activities. Businesses that were using all the electricity generated from solar panels, not receiving a turnover, or were generating less than £1,000 in FIT payments, were excluded.

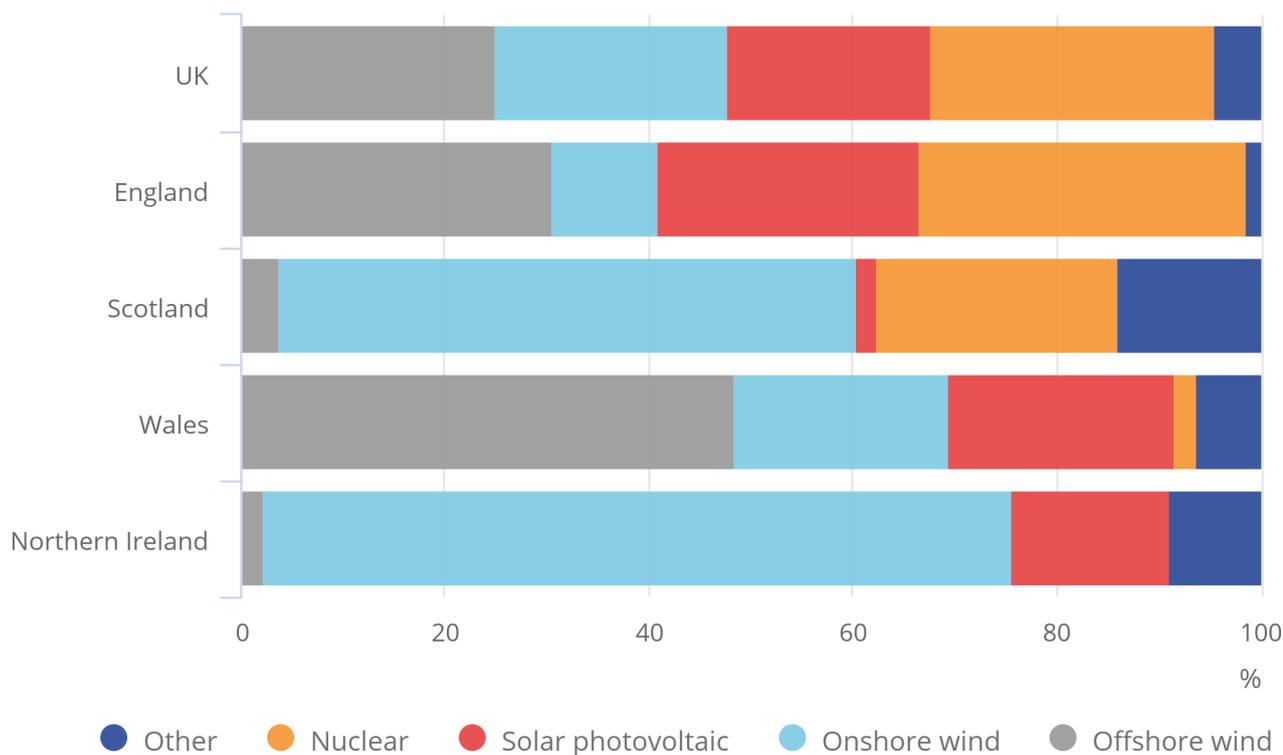
Figure 8, which presents the sectors broken down by UK country, shows that the turnover generated within this group was more evenly distributed between sectors than the number of businesses. The nuclear sector generated more turnover than any other sector in the low carbon electricity group at 27.9%, which was equivalent to £3.5 billion, while the solar photovoltaic sector generated 19.9% (£2.5 billion) of group turnover. The offshore wind sector generated £3.1 billion turnover and the onshore wind sector generated £2.8 billion turnover. This is despite onshore wind being the leading individual technology for the generation of electricity from renewable sources from 2014; onshore wind accounted for 29% and offshore wind accounted for 21% of renewable electricity generation². This reflects the fact that the scope of the offshore and onshore wind sectors is much wider than electricity generation, including activities such as design, construction and installation.

Figure 8: Low carbon electricity group turnover, 2014

UK and UK country

Figure 8: Low carbon electricity group turnover, 2014

UK and UK country



Source: Office for National Statistics

Notes:

1. The estimates for onshore wind (Wales and Northern Ireland), offshore wind (Scotland and Wales) and solar (Wales) should be treated with caution due to high coefficients of variation.
2. "Other" includes hydropower, other renewable electricity and carbon capture & storage.

There was considerable variation in the composition of turnover in the low carbon electricity group among the UK countries in 2014. In England, similar to the UK, the nuclear and offshore wind sector generated the most turnover, 32.2% and 30.5% respectively. In Scotland the onshore wind sector generated the largest turnover, 56.6% (£1.6 billion). In Wales the offshore wind sector generated a turnover of 48.4% (£345 million), while in Northern Ireland the onshore wind sector generated the largest turnover of 73.4% (£189 million).

Table 7 presents the UK country where the majority of activities took place, for example, 55.9% of all UK onshore wind turnover was generated in Scotland with 32.1% in England. However among the other groups the greater proportion of activities took place in England.

Table 7: Low carbon electricity group turnover, 2014

UK country

	England	Scotland	Wales	Northern Ireland	%
Offshore wind	85.3	3.4	11.1		0.2
Onshore wind	32.1	55.9	5.3		6.7
Solar	89.9	2.1	6.4		1.6
Nuclear	80.5	19.0	0.4		0.0

Source: Office for National Statistics

1. The estimates for onshore wind (Wales and Northern Ireland), offshore wind (Scotland and Wales) and solar photovoltaic (Wales) should be treated with caution due to high coefficients of variation.

2. Figures may not sum due to rounding.

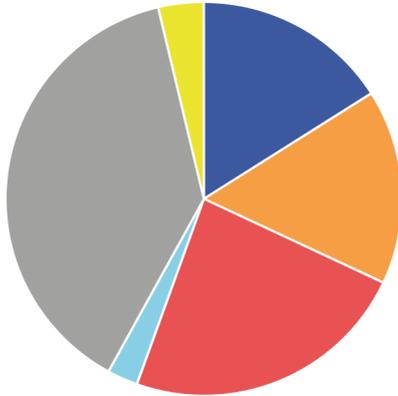
Nearly 4 in 10 (38.3%) FTEs in the low carbon electricity group were in the nuclear sector (15,500) in 2014 (Figure 9). The solar photovoltaic sector employed 23.5% (9,500) of the group's FTE employees; despite having by far the greatest number of businesses. The offshore and onshore wind sectors each accounted for 16.0% (6,500) of the group's FTE employees.

Figure 9: Employees (full-time equivalents) in the low carbon electricity group: by sector, 2014

UK, percentages

Figure 9: Employees (full-time equivalents) in the low carbon electricity group: by sector, 2014

UK, percentages



Source: Office for National Statistics

Notes:

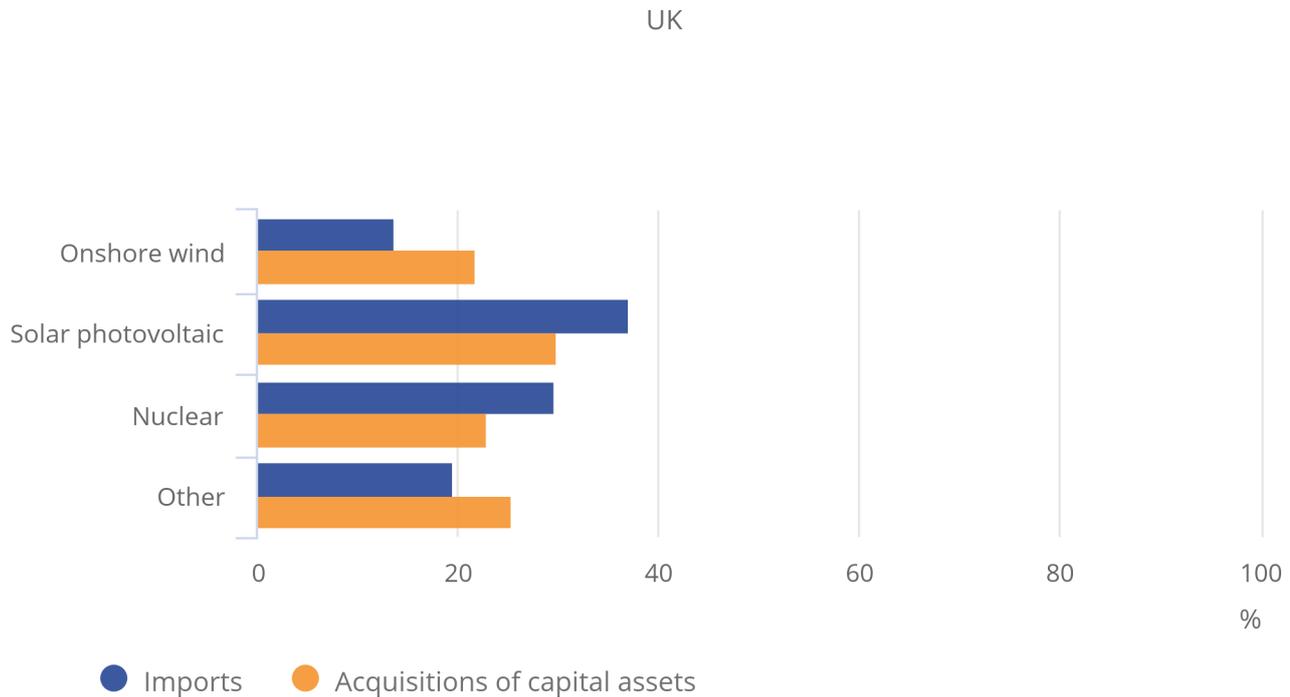
1. "Other" includes other renewable electricity and carbon capture and storage.

The solar photovoltaic sector imported £380.5 million in 2014, accounting for 37.1% of low carbon electricity group imports (Figure 10). The high imports in this sector are likely to be the acquisitions of capital assets, with the solar sector accounting for 29.8% (£1.8 billion) of low carbon electricity group acquisitions of capital assets. Similarly, the nuclear sector imported 29.6% (£303.5 million) of the group's total imports, and acquired 23.0% (£1.4 billion) of group capital assets³.

Figure 10: Imports and acquisitions of capital assets in the low carbon electricity group, 2014

UK

Figure 10: Imports and acquisitions of capital assets in the low carbon electricity group, 2014



Source: Office for National Statistics

Notes:

1. The estimates for nuclear (imports and acquisitions) should be treated with caution due to high coefficients of variation.
2. "Other" includes offshore wind, hydropower, other renewable electricity and carbon capture and storage.

Businesses in the low carbon electricity group operate across many different industries, reflecting the diverse activities that are undertaken in this group, including electricity generation, construction, manufacturing and design. In 2014, 18.9% (5,000) of the group businesses were classified in the construction industry, while 17.0% (4,500) were classified in the professional, scientific and technical activities industry (Table 8).

The electricity, gas, steam and air conditioning supply industry generated the highest turnover in 2014 in this group, £6.3 billion, accounting for 50.5% of low carbon electricity group turnover. In contrast, this industry accounted for just 7.5% of low carbon electricity group businesses. The construction industry, which had the largest single amount of businesses in the group, generated 15.2% (£1.9 billion) of group turnover, while the professional, scientific and technical activities industry generated 12.3% (£1.5 billion) of group turnover.

Table 8: Industry activity in the low carbon electricity group, 2014

UK

		%
	Number of Businesses	Turnover
Electricity, gas, steam and air conditioning supply	7.5	50.5
Construction	18.9	15.2
Wholesale and retail trade; repair of motor vehicles and motorcycles	1.9	3.0
Information and communication	1.9	0.3
Professional, scientific and technical activities	17.0	12.3
Other	52.8	18.8

Source: Office for National Statistics

1. The estimates for information and communication (business and turnover) and professional, scientific and technical activities (business) should be treated with caution due to high coefficients of variation.

2. "Other" includes the following industries: agriculture, forestry and fishing, mining and quarrying, manufacturing, water supply; sewerage, waste management and remediation activities, transportation and storage, accommodation and food service activities, real estate activities, administrative and support service activities, public administration and defence; compulsory social security, education and other activities.

3. Figures may not sum due to rounding.

Offshore wind sector activity was the primary activity of 38.3% of businesses operating in this sector. These businesses generated 23.5% of sector turnover and employed 62.4% of employees. Many of these primary offshore wind businesses were involved in manufacturing which requires a greater number of workers than other activities in this sector, such as electricity generation. In contrast, primary onshore wind businesses generated 33.8% of sector turnover and employed 38.2% of employees. Primary onshore wind sector activities were more evenly distributed between manufacturing, design, installation and electricity generation compared with offshore wind. Primary solar sector businesses generated 50.8% of turnover and employed 80.9% of employees. This is due to a high proportion of these businesses being involved in manufacturing and installation activities, which require a greater number of workers than electricity generation.

Low carbon heat group

Table 9: Low carbon heat group activity, 2014

UK

Number of businesses	3,000
Turnover (£ thousands)	1,383,000
Employees (full-time equivalents)	7,000
Exports (£ thousands)	39,000
Imports (£ thousands)	..
Acquisitions (£ thousands)	..
Disposals (£ thousands)	1,500

Source: Office for National Statistics

The low carbon heat group includes the renewable heat and renewable combined heat and power sectors. Overall, 3,000 businesses operated in this group in 2014, generating around £1.4 billion turnover and employing 7,000 FTEs (Table 9).

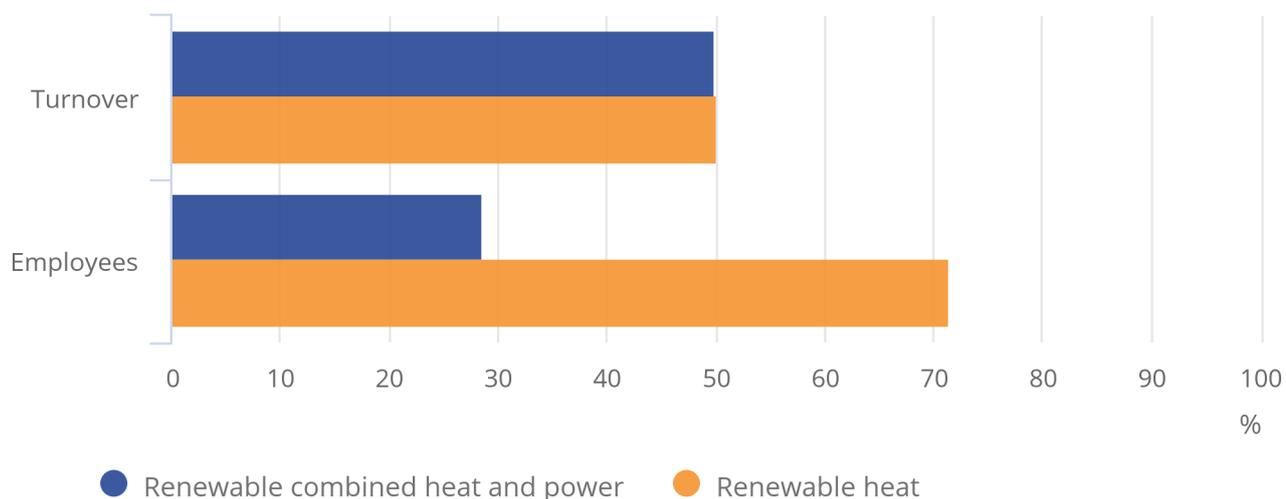
In 2014, turnover generated in the low carbon heat group was split evenly between the renewable heat sector (which generated £693.5 million) and the renewable combined heat and power sector (which generated £689.5 million)(Figure 11). However, the renewable heat sector had the greatest number of employees (5,000 FTEs), while the renewable combined heat and power sector employed 2,000 FTEs. The renewable heat sector also accounted for the vast majority of low carbon heat group businesses.

Figure 11: Turnover and employees (full-time equivalents) in the low carbon heat group: by sector, 2014

UK

Figure 11: Turnover and employees (full-time equivalents) in the low carbon heat group: by sector, 2014

UK



Source: Office for National Statistics

The majority of businesses (83.3%) that were active in the low carbon heat group were in the construction industry. Businesses in this industry were responsible for generating 29.2% (£403.5 million) of group turnover and employing 57.1% (4,000) of the group’s FTE employees (Table 10). Businesses in the electricity, gas, steam and air conditioning supply industry generated 12.0% (£165.5 million) of group turnover and employed 7.1% (500) of the group’s FTEs.

Table 10: Industry activity in the low carbon heat group, 2014

UK

	Employees (full-time equivalents)	Turnover %
Electricity, gas, steam and air conditioning supply	7.1	12.0
Construction	57.1	29.2
Professional, scientific and technical activities	7.1	2.8
Other	28.6	56.0

Source: Office for National Statistics

1. The estimates for construction (turnover) should be treated with caution due to high coefficients of variation.
2. "Other" includes the following industries: agriculture, forestry and fishing, manufacturing, water supply; sewerage, waste management and remediation activities, wholesale and retail trade; repair of motor vehicles, transportation and storage, information and communication, real estate activities, administrative and support service activities and public administration and defence; compulsory social security.
3. Figures may not sum due to rounding.

Energy from waste and biomass group

Table 11: Energy from waste and biomass group activity, 2014

UK

Number of businesses	7,500
Turnover (£ thousands)	5,565,000
Employees (full-time equivalents)	11,500
Exports (£ thousands)	..
Imports (£ thousands)	1,384,500
Acquisitions (£ thousands)	1,299,500
Disposals (£ thousands)	..

Source: Office for National Statistics

The energy from waste and biomass group includes the bioenergy and alternative fuels sectors⁴. Overall, 7,500 businesses operated in this group in 2014 and generated £5.6 billion turnover. This group employed 11,500 FTE employees (Table 11).

Activity in the energy from waste and biomass group was distributed amongst many industries in 2014. The electricity, gas, steam and air conditioning supply sector generated 29.1% (£1.6 billion) of the group's turnover and employed 8.7% (1,000) of the group's FTE employees (Table 12). Reflecting the fact that this group captures additional activities to electricity generation, including production and installation of infrastructure, the construction industry generated 8.9% (£496 million) of group turnover and employed 26.1% (3,000) of the group's FTE employees. The water supply, sewerage, waste management and remediation activities industry also contributed to the energy from waste and biomass group, accounting for 9.1% (£505 million) of turnover and employing 13.0% (1,500) of the group's FTE employees. The professional, scientific and technical activities industry accounted for 5.9% (£326.5 million) of group turnover and employed 13.0% (1,500) of the group's FTE employees. Many of these businesses were involved in design activities; consultancy activities were captured separately by the low carbon services group.

Table 12: Industry activity in the energy from waste and biomass group, 2014

UK

	Employees (full-time equivalents)	Turnover	%
Electricity, gas, steam and air conditioning supply	8.7	29.1	
Water supply; sewerage, waste management and remediation activities	13.0	9.1	
Construction	26.1	8.9	
Professional, scientific and technical activities	13.0	5.9	
Other	39.2	47.0	

Source: Office for National Statistics

1. The estimates for construction (employees) should be treated with caution due to high coefficients of variation.

2. "Other" includes the following industries: agriculture, forestry and fishing, mining and quarrying, manufacturing, wholesale and retail trade; repair of motor vehicles, transportation and storage, information and communication, real estate activities, administrative and support service activities, public administration and defence; compulsory social security, education and other activities.

3. Figures may not sum due to rounding.

Energy efficient products group

Table 13: Energy efficient products group activity, 2014

UK	
Number of businesses	52,000
Turnover (£ thousands)	21,871,000
Employees (full-time equivalents)	155,500
Exports (£ thousands)	585,000
Imports (£ thousands)	1,563,500
Acquisitions (£ thousands)	625,500
Disposals (£ thousands)	..

Source: Office for National Statistics

The energy efficient product group includes the energy efficient lighting, other energy efficient products, and energy monitoring, saving or control systems sectors. This was the largest LCRE group in 2014, generating £21.9 billion turnover and employing 155,500 FTE employees (Table 13).

The energy efficient products group accounted for 53.9% of LCRE economy businesses. The majority of these businesses (31,500) operated in the other energy efficient products sector, which includes amongst other activities⁵, insulation, energy efficient doors and windows, and sustainable buildings and architecture. The energy efficient lighting sector included 13,500 businesses and the energy monitoring, saving or control systems sector, 6,500 businesses.

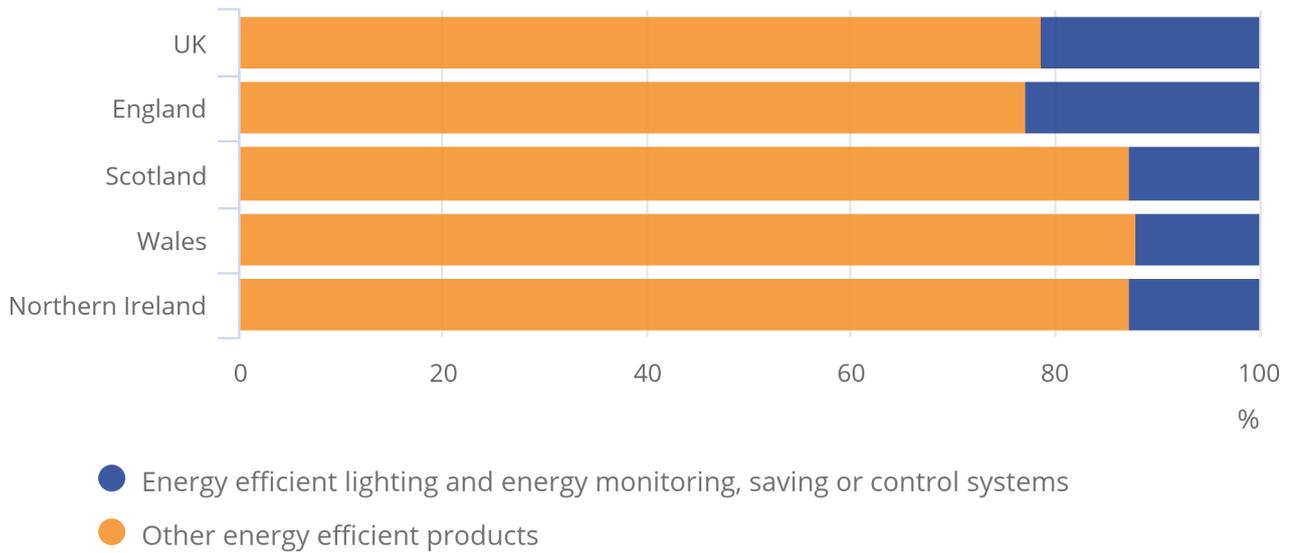
The other energy efficient products sector generated the greatest turnover in this group, 78.8% (£17.2 billion), for the UK in 2014 (Figure 12). This contribution was similar across the UK countries, with the sector generating 77.3% (£14.5 billion) of group turnover in England, 87.4% (£1.8 billion) in Scotland, 88.0% (£644 million) in Wales and 87.4% (£330 million) in Northern Ireland.

Figure 12: Energy efficient products group turnover, 2014

UK and UK country

Figure 12: Energy efficient products group turnover, 2014

UK and UK country



Source: Office for National Statistics

Notes:

1. Further data can be found in the estimates dataset (subject to disclosure control).

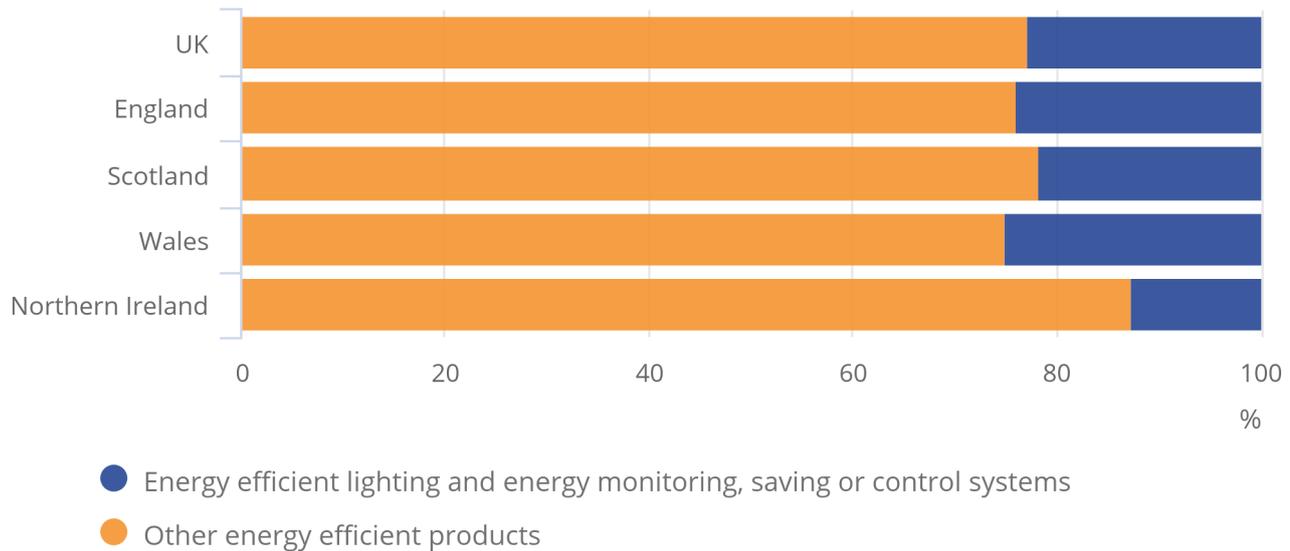
The other energy efficient products sector employed the majority of the group's employees in the UK overall (77.2%), equivalent to 120,000 FTE employees (Figure 13). The sector also employed the majority of the group employees across the UK countries, with 76.2% (102,500) in England, 78.3% (9,000) in Scotland, 75.0% (4,500) in Wales and 87.5% (3,500) in Northern Ireland.

Figure 13: Employees (full-time equivalents) in the energy efficient products group, 2014

UK and UK country

Figure 13: Employees (full-time equivalents) in the energy efficient products group, 2014

UK and UK country



Source: Office for National Statistics

Notes:

1. The estimates for other energy efficient products (Northern Ireland) should be treated with caution due to high coefficients of variation. Further data can be found in the estimates dataset (subject to disclosure control).

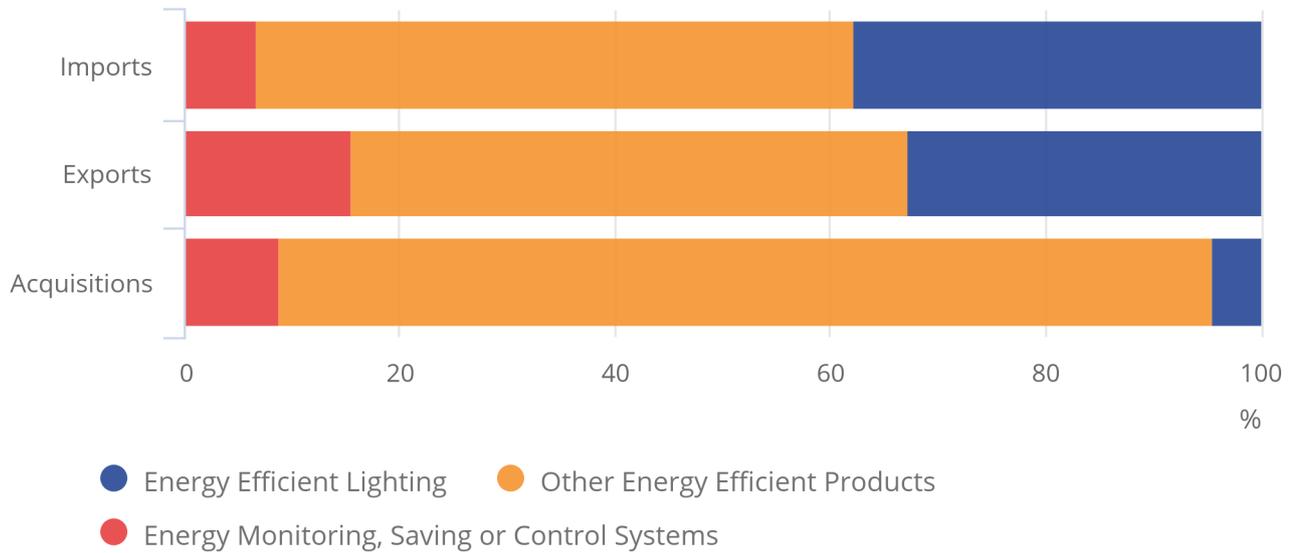
The other energy efficient products sector accounted for 51.7% (£302.5 million) of group exports in 2014, with the energy efficient lighting sector accounting for 32.8% (£192 million) (Figure 14). Imports were relatively high in the energy efficient products group, accounting for 26.5% (£1.6 billion) of total LCRE imports. Similar to exports, the majority of group imports were in the other energy efficient products sector (55.5%) equivalent to £867 million and the energy efficient lighting sector (37.8%) equivalent to £591 million. The high imports in this sector are likely to be the acquisitions of capital assets, with the other energy efficient products sector accounting for 86.9% (£543.5 million) of acquisitions.

Figure 14: Imports, exports and acquisitions in the energy efficient products group, 2014

UK

Figure 14: Imports, exports and acquisitions in the energy efficient products group, 2014

UK



Source: Office for National Statistics

The majority of businesses (80.8%) that were active in the energy efficient products group in 2014 were in the construction industry. Businesses in this industry were responsible for generating 44.1% (£9.6 billion) of group turnover and employing 51.1% (79,500) of the group's FTE employees (Table 14). Businesses in the manufacturing industry generated 34.8% (£7.6 billion) of the group's turnover and employed 34.4% (53,500) of the group's FTE employees.

Table 14: Industry activity in the energy efficient products group, 2014

UK

	Employees (full-time equivalents)	Turnover %
Manufacturing	34.4	34.8
Electricity, gas, steam and air conditioning supply	1.6	1.1
Construction	51.1	44.1
Information and communication	0.3	0.3
Professional, scientific and technical activities	6.1	2.5
Other	6.4	17.2

Source: Office for National Statistics

1. "Other" includes the following industries: agriculture, forestry and fishing, mining and quarrying, water supply; sewerage, waste management and remediation activities, wholesale and retail trade; repair of motor vehicles and motorcycles, transportation and storage, real estate activities, administrative and support service activities, public administration and defence; compulsory social security and other activities.

2. Figures may not sum due to rounding.

Low carbon services

Table 15: Low carbon services group activity, 2014

UK

Number of businesses	6,000
Turnover (£ thousands)	1,152,000
Employees (full-time equivalents)	13,000
Exports (£ thousands)	..
Imports (£ thousands)	..
Acquisitions (£ thousands)	..
Disposals (£ thousands)	..

Source: Office for National Statistics

The low carbon services group consists of only the low carbon services sector. This group generated £1.2 billion turnover and employed 13,000 FTE employees in 2014 (Table 15). Businesses in this group provided consultancy activities for all other LCRE sectors. Design activities however, were captured by the individual LCRE sector estimates.

As expected, the vast majority of activity in the low carbon services group was undertaken in the professional, scientific and technical activities industry. This industry generated 72.2% (£832 million) of group turnover and employed 92.3% (12,000) of FTEs employees.

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

Table 16: Low emission vehicles and infrastructure and fuels cells and energy storage group activity, 2014

UK	
Number of businesses	1,500
Turnover (£ thousands)	3,788,500
Employees (full-time equivalents)	11,000
Exports (£ thousands)	2,874,000
Imports (£ thousands)	..
Acquisitions (£ thousands)	135,500
Disposals (£ thousands)	1,000

Source: Office for National Statistics

The low emission vehicles group generated £3.8 billion turnover and employed 11,000 FTE employees in 2014 (Table 16). Regional and industrial information are not available due to disclosure control.

Notes for Detailed Group Analysis

1. Further data can be found in the [Estimates dataset](#) (subject to disclosure control) and accompanying coefficients of variation (CV) are presented in the [CV dataset](#).
2. Further details can be found in [Renewable sources of energy. Dukes 2015](#)
3. The estimates for imports and acquisitions for the nuclear sector should be treated with caution due to high coefficients of variation.
4. No sector specific estimates are available for this group due to disclosure control.
5. The other energy efficient products sector includes the design, manufacture and installation of:
 - Energy efficient doors and windows
 - Heating and ventilation, such as condensing boilers, ventilation and heating recovery
 - Insulation such as loft, external wall, roof insulation
 - Reducing energy consumption for heat or air conditioning by minimising 'leakage' of heat
 - Energy efficient building materials or technologies
 - Sustainable buildings and architecture
 - Either material with greater insulation properties or durability properties or those requiring significantly less carbon emission in their manufacture or recycling waste materials in their manufacture

Future Work

This bulletin has presented final estimates of direct low carbon and renewable energy economy in 2014. Estimates of indirect LCRE activity using published multipliers will be published later this year.